THE BUILDER

INCORPORATING

"ARCHITECTURE" AND "THE BRITISH ARCHITECT"

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"NO MORE DAGENHAMS"

NOWADAYS nearly every expert on housing almost insists on showing even the mildly interested his post-war plans for rehousing; plans for building vast housing estates on city boundaries, plans for blocks of flats, even plans for satellite towns are vigorously unfurled before one's bemused eyes. "There, you see, we will have the roads, there the shopping centre, the church, the school, the community centre. Nothing you see has been overlooked. There will be no more Dagenhams."

A "Dagenham" to the initiated means the type of housing estate built after the last war, under the various rebuilding and slum clearance schemes. They were vast collections of houses, nice semi-detached houses very often, on the verge of the countryside. Often they were built with some regard for the preservation of trees, and without that dead sameness of design and detail which characterised the Victorian and Edwardian artisan dwelling. But they suffered from one great drawback—the planners had thought in terms of houses rather than in terms of neighbourhoods. In only too many cases no account had been taken of the need for churches, shops, adequate transport facilities, in many cases not even for schools; pillar boxes, even, were sometimes lacking.

What was the result? People were transferred from their overcrowded but very friendly slums, to a wilderness of houses where they were strangers in a strange land, and where there were none of those little etceteras of social living that transmute a collection of houses into a community of happy neighbours. In the centre of the city, with the market round the corner where bits and bobs could be bought cheaply by the shrewd shopper, where the school was "just down the road" and the pub "just across the way" and the Men's Institute, the Settlement and the Boys' Club within a stone's throw, there had at least been compensations for inadequate housing. Small wonder that after a few months on such estates many of those who had been most clamant in their demands for a "council house" besought housing managers to return them to their old haunts—small wonder that boys and girls who found "nowt to do" in the evenings, either within the new but small homes or without, sought refuge from boredom in the idle pranks of scaring the neighbours, of trampling down their cabbage patches and breaking lamp-posts and newly planted trees. In one area alone where there were three fairly small housing estates of this kind, after five years of a social living 68 per cent. of the total juvenile delinquency in the whole city was found not in the overcrowded centre but on the housing estates.

It was only when the discontent of the adults found expression in the daily Press and when the urgency of the juvenile problem forced its attention on authority that the provision of community centres, meeting places for old and young, began to be recognised not as a luxury but as a necessity if new estates were not to be reduced to an even more barbaric slum of mind and spirit than the old slum had been of physical environment.

In fairness to Dagenham it must be stated that on this, the largest housing estate in the world, really beautiful civic buildings and well-equipped community centre and club rooms have since been built, and extensively and imaginatively used.

This time, we are told, it will be different. The sites for these social amenities—clubs, shops, schools, churches and pubs—are clearly marked. The Ministry of Education has published a red-covered booklet called "Community Centres"; the National Council of Social Service has produced a new edition of "Village Halls and Social Centres in the Countryside"; the London Council of Social Service has made an inquiry into "The need for Community Centres in Inner and Outer London"; and enthusiasm and planning for a while ran hand in hand.

Of late, however, enthusiasm has been tempered by the reality of priorities. There is a genuine fear abroad, particularly among the more far-sighted, that priorities in building will mean that although the "sites" for all these social amenities will at least be ear-marked and therefore conveniently placed this time, the actual building will be delayed until long after the houses have been completed and let. At first glance it would seem that everyone should be housed first, before other buildings are embarked upon, but no family is really adequately housed unless social amenities are available for use as soon as are the houses.

The community centre, the school, the shops and the public houses must be provided simultaneously if discontent and distressing social problems are to be avoided. For the whole thing is a vicious circle—unless builders, architects, surveyors, the Local Education Authorities and cinema proprietors, shopkeepers and publicans assume their responsibility to anticipate a need rather than to wait until there is "an active local demand based on ascertained needs" (this is a quotation from the Ministry of Education Circular 20, not from the report submitted to the directors of a group of chain stores), there will be Dagenhams yet again.

Even if a few people should have to wait a little longer for the house of their dreams, when they did get it it would be nearer to their heart's desire. Moreover, such a policy would pay rich dividends not only in the prevention of much delinquency (always more satisfactory and cheaper than its cure) but also in the prevention of moral apathy and spiritual thwarting which characterised life on many housing estates between the wars. Thousands of young people will be coming back from the Services where for perhaps the first time in their adult life their minds have been awakened to new interests and a new social awareness. If they find themselves re-housed in areas where five years and more may elapse before they can take up those interests where they left off, if there is a time-lag, then for many there will be no new beginning, only a relapse into the old irresponsible frame of mind.

Unless, indeed, neighbourhood social amenities without are provided *pari passu* with social amenities within the home, the universal provision of that much publicised refrigerator in the home of the future may yet be but a symbol of the cold comfort of the life of the neighbourhood in which those homes are situated.

NOTES AND NEWS

Waterloo Bridge.

WATERLOO BRIDGE, which has been fully in use for some considerable time, was officially opened last Monday by Mr. Herbert Morrison, M.P., Lord President of the Council. The general appearance of the bridge is well shown in the accompanying photograph, taken from the top of the Shot Tower. Much as we may regret the loss of the old bridge, it must be said that the new one is a fine, commodious structure. It is about twice the width of the old, carrying six lines of traffic instead of three, and is as typical of our time as Rennie's masterpiece was of his. It is not yet fully completed. The four stone pedestals at the ends of the bridge are yet without their sculpture groups, and the present handrails and lamp-standards are temporary; they will be replaced, it is stated, when conditions permit, "by new ones in keeping with the structure." Many will think that they might well be retained. Made of steel tubing, they have a dignified simplicity which is perfectly in keeping with the clean, modern lines of the bridge.

T.U.C. National Headquarters.

MR. PERCY THOMAS, P.R.I.B.A., has been appointed consulting architect for the Trades Union Congress new £350,000 national headquarters, incorporating a trade union education institution.

B.o.T. Exhibition Architect.

MR. BASIL SPENCE, A.R.I.B.A., F.R.I.A.S., of the firm of Messrs. Rowand Anderson and Paul and Partners, architects, Edinburgh, has been engaged as chief architect for the Board of Trade Exhibition at Earl's Court, London, next summer. Mr. Spence was one of the architects engaged on the British Empire Exhibition in Glasgow in 1938, and was largely responsible for Scottish pavilions in collaboration with Mr. T. S. Tait, and also for the I.C.I. Hall.

Professional Announcements.

MR. P. H. BRADDOCK, A.R.I.B.A., A.A.Dip. (Hons.), is now in practice at Orchard House, 14, Great Smith-street, Westminster, S.W.1, and will be glad to receive trade circulars, etc.

MR. J. N. AYLWIN, A.R.I.B.A., is now released from the Forces, and as the lease of his pre-war offices at 7, Park-lane, W.1, has terminated, he is resuming practice as a chartered and registered architect from 50, Pall Mall, S.W.1, as from December 3. (Telephone: Whitehall 1480.)

LIEUTENANT-COLONEL RONALD WARD, R.E., F.R.I.B.A., has now been released from the Army and has resumed practice at 33, St. George's-drive, S.W.1. (Telephone, Victoria 5531). He will be pleased to receive trade catalogues and other practical building information.

MAJOR D. OSPALAK, R.E., L.R.I.B.A., chartered architect, having been released from the Forces, has resumed his practice at 37, Panton-street, Haymarket, S.W.1 (Telephone Whitehall 7261), and will be glad to receive trade catalogues, etc. MESSRS. ALFRED OSPALAK AND COMPANY, architects and surveyors, of the same address, would be glad to receive trade catalogues.

MESSRS. YOUNG AND HALL, chartered and registered architects, of Crown Buildings, 9, Southampton Row, London, W.C.1, announce that their partner, Mr. F. J. Humphry, who has been with this firm for more than 25 years, is retiring from practice on December 31. The practice will be carried on by the remaining partners, who will superintend any work hitherto dealt with by Mr. Humphry.

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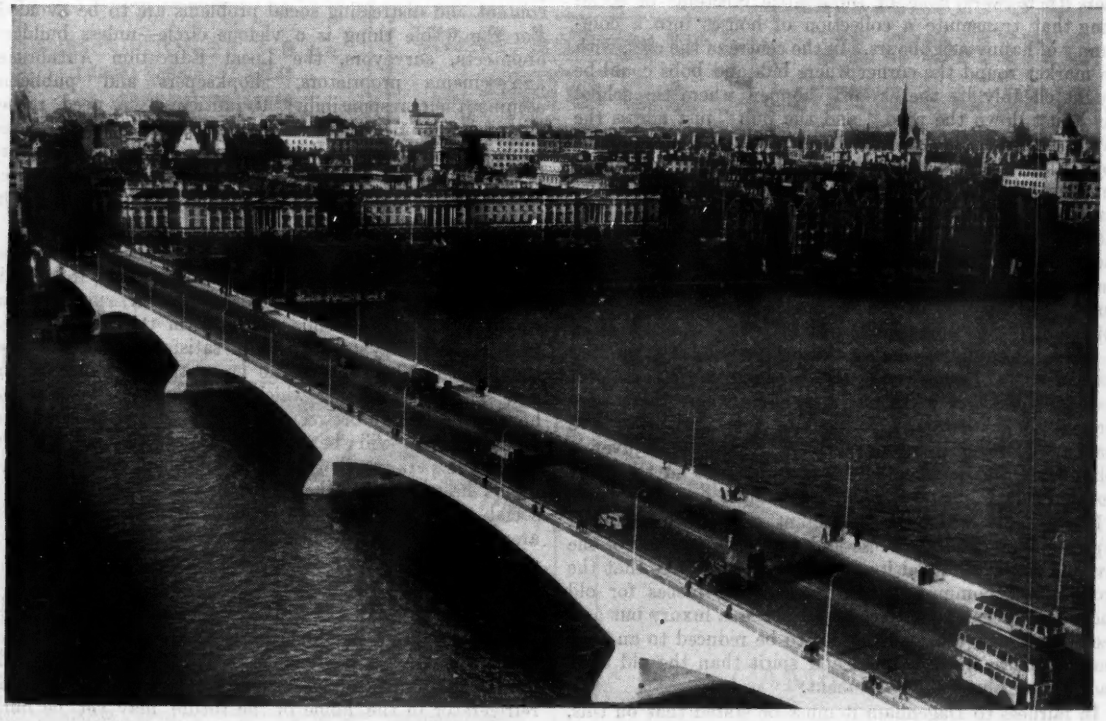
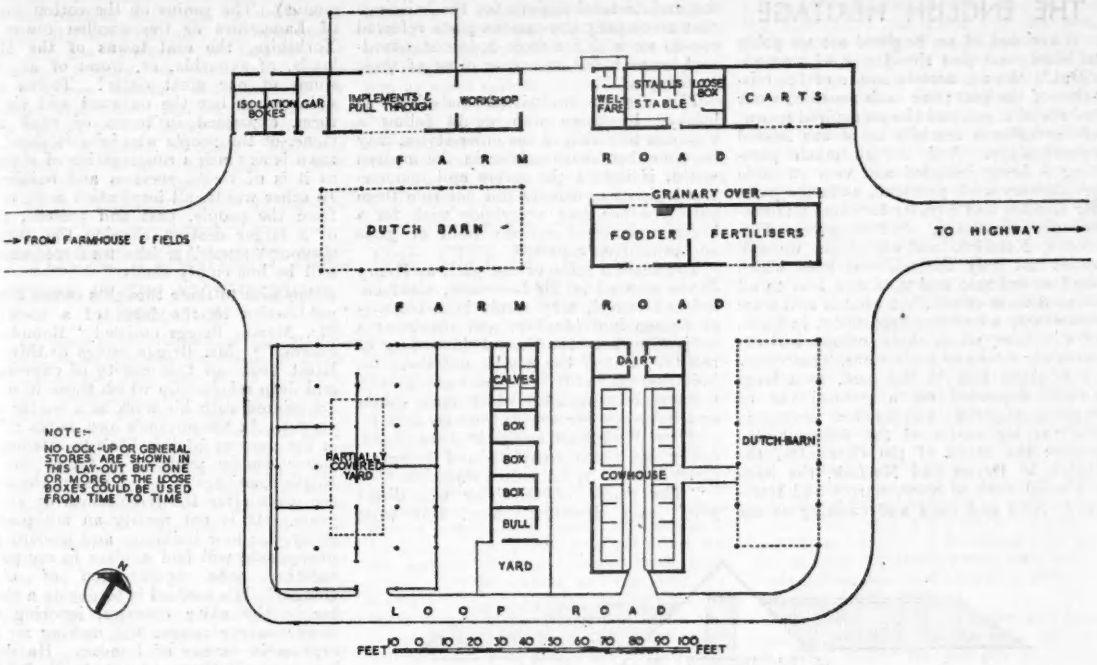
From *The Builder* of 1845.

Saturday, December 13, 1845.

The Act is not put into an officer's hands simply that he may find occasions to demand a fee, but that he may see its provisions for the general good (often opposed to private interests) honestly carried out; provision is made in it to pay him fairly for all that he does, but anything beyond this he ought not to look for; and what is more, *must* not. *From an editorial drawing attention to several instances of rapacity on the part of London district surveyors.*



WATERLOO BRIDGE. The new bridge was opened by Mr. Herbert Morrison (Lord President of Council) on Monday. The bridge is referred to in a Note on this page.



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LAYOUT OF FARMSTEAD FOR 250 ACRES OF MIXED FARMING WITH 25-30 COWS IN MILK.

FARM BUILDINGS

Of all the series of "Post-War Building Studies" published by the Stationery Office, none deals with a more important subject than the seventeenth, which is now before us.* There can now be little doubt that the country will not again tolerate the decay of the great agricultural industry, such as we saw between the wars. Prosperity in agriculture depends on many factors, with the weather, once almost its only enemy, no longer the most formidable. The other factors are political, social and economic. Fortunately, at a time when political temper is running high, there is little difference of opinion between the extremes of Party doctrine as to the futility of stealing labour from agriculture for the purpose of making things with which to buy the products that can be as well provided in our own fields and stockyards.

On the social side, we may not yet have solved the problem of making country life as attractive to the common man as town life is imagined to be, and it is evident that there will be much ground to be broken in the fields of planning before we can feel satisfied upon that score. It is quite obvious that the land girl, much as we have to thank her for, cannot remain a permanent solution of the labour problem.

The architect and the town planner will be much called upon to show the way towards the ideal village community, and the ideal home units within it.

But these matters must be solved; if we have not faith in their solution, the prospect for the countryside is still a bleak one. Assuming their solution, we shall have a major part to play in the equipment of the industry with the right static machinery in the form of buildings and layout.

The old farmstead has punctuated the charm of the countryside with unconscious harmonies, and from ages in which the word "planning" was almost unknown, common sense in construction and arrangement has often put to shame the more conscious design of more recent times. Old barns, rudely but solidly assembled, still serve their vital purpose upon the farm, and the farmhouses themselves, where the jealous eye of the tired townsman has not yet torn them from their proper spheres, provide homes of dignity and service for the man who has the organising of many acres.

But methods change with the years, and not always for the worse, whatever we are inclined to profess as the years overtake us. Agriculture becomes more and more a piece of machinery, in which the latest methods and the latest organisation become ever more important. The architect, for too long excluded from all but the rich man's hobby upon the land, thus finds himself called upon to apply his talents to a problem that is full of interest and well suited to his common ways of thought. Order, purpose and simplicity are qualities he meets in all the varied spheres he has to enter upon as an architect, and these are the first principles of planning upon the farm.

The publication under review, the product of a committee appointed by the Ministry of Agriculture and Fisheries, is an extremely thorough piece of work, both in the descriptive matter and in the clear illustrations with which it is amply equipped. Its presentation is in a form that can be understood by the intelligent farmer as well as by the latter's more technically-minded advisers. Much of the matter it deals with can be found in textbooks and Government pamphlets, but the value of collecting even these sources of information between one set of covers would have been well worth while, even without the additional information which the book contains.

Some of the methods of dairy farming are still controversial, and there will no doubt be something wrong when controversy ceases among the thoughtful. But this book gives a well-balanced review of the various alternatives, without any excessive bias towards one or other of the methods. The designer of farm buildings in the near future will find much valuable information within its covers, whatever may be the preferences entertained by his client.

The architect to the farm will thus enter upon his task as upon a live problem, learning much by the grouping and siting of the old farms, but applying to the problem a mind awake to the needs of to-day. Model farms, dressed in the costume of other days, will stand condemned if they do not serve the needs of the present without waste, either in first cost or maintenance, and the designer who is not willing to use those materials on the market which offer all the farmer needs, has something deficient in his makeup. We need not fear harm to the landscape if the farm structure continues to be of the simplest shape and assembly, sited where it is most needed and related to neighbours, for that was the way the old farmstead grew.

The architect is certainly welcomed to the task in the present mood of the industry, and it will rest with him whether he continues to hold his place or whether he fails to prove his metal. The good farmer has always been a man of clean and orderly habits, and his success has been limited not only by the forces of economics and weather, but by his capacity to think and plan in a big way. Those are the same qualities which make the ideal client, and if farmer and architect can work together in the task ahead we can look for vast improvements.

Perhaps the only remaining plea would be to permit still a few personal fads for the individual farmer to cherish, and fewer personal fads among the officials who still make the farmer's life less trouble-free than it might be.

G. M. A.

* *Farm Buildings: Post-War Building Studies*, No. 17. H.M.S.O. Price 3s.

THE ENGLISH HERITAGE

WHAT sort of an England are we going to build now that the drums of war are silent? We are acutely aware of the mistakes of the past; the drab squalor of our industrial towns and the uninspired sprawl of the suburbs reminds us of our missed opportunities. And though much planning is being initiated and very valuable preliminary work prepared, as in the plans for London and Greater London, Middlesbrough, Coventry, Southampton, Plymouth, Norwich, and elsewhere, we still await not only the national plan which shall co-ordinate and give direction to all these diverse efforts, but what is still more important, a national expression, in terms of structure, which shall embody and express our aims and aspirations. The beauty of England has, in the past, to a large extent depended on a natural use of regional materials employed according to the varying crafts of the different districts: the stone of the Cotswolds, the thatch of Devon and Norfolk, the half-timbered work of Kent, Surrey and Hereford, etc.; and good and exciting as are the architectural designs for the buildings that accompany the various plans referred to—do we wish for more or less standardised towns based on one or other of these prototypes?

The use of traditional materials, so beloved by those who would follow a vigorous tradition of the older styles, may be somewhat anachronistic in the modern world, if indeed the severe and remorseless logic of economics did not rule them out. Neither does everybody wish for a brave new world entirely built of glass and reinforced concrete.

Too acute a sense of the past, as Henry James showed in his last—and, alas! unfinished—novel, may result in a travesty of human individuality, and too great a projection into the future in a loss of reality. But if the past is not there for imitation it still remains as a rich tapestried background which must colour and influence our work of to-day and to-morrow. We cannot escape it if we would, either by a too complete and imitative acceptance or by an entire rejection.

"The genius of the hour will direct you," said Emerson. Yes! But what genius? The genius of the cotton towns of Lancashire or the woollen towns of Yorkshire, the coal towns of the Midlands, of suburbia, or, worst of all, the slums of our great cities? Towns and villages are but the outward and visible form, expressed in terms of brick and stone, of the people who inhabit them. A town is as much a congregation of citizens as it is of roads, services and buildings. In other words, all inspiration must come from the people, past and present, part of a larger destiny shaping the future, else our "finest" architectural monuments will be but empty shells.

Apposite to these thoughts comes a new publication in the form of a book by Mr. Martin Briggs entitled "Round the Shires."* Mr. Briggs brings to this, his latest work, all that clarity of expression and deep scholarship which those who are acquainted with his work as a writer will expect. In the author's own words: "It is the purpose of this book to attempt to foster county pride as a factor in the English heritage of which we are the more conscious after the tribulations of recent years. It is not merely an antiquarian study, for new buildings and modern improvements will find a place in my pages together with appreciation of older things." His method is to devote a chapter to the older counties, ignoring the newer county towns, but making an exception in favour of London. He does, however, give two chapters to Yorkshire. As Mr. Briggs says, "Yorkshire is such a large county," and, moreover, as a Yorkshireman he naturally gives it pride of place.

Taking each county in turn, the author deals with the geological, geographical, historical, archæological, sociological, and, above all, architectural aspects of his compartmented subject, and by a skilful subordination of the parts to the whole gives us in sequence a series of regional studies which together make a most valuable contribution to the knowledge of our country.

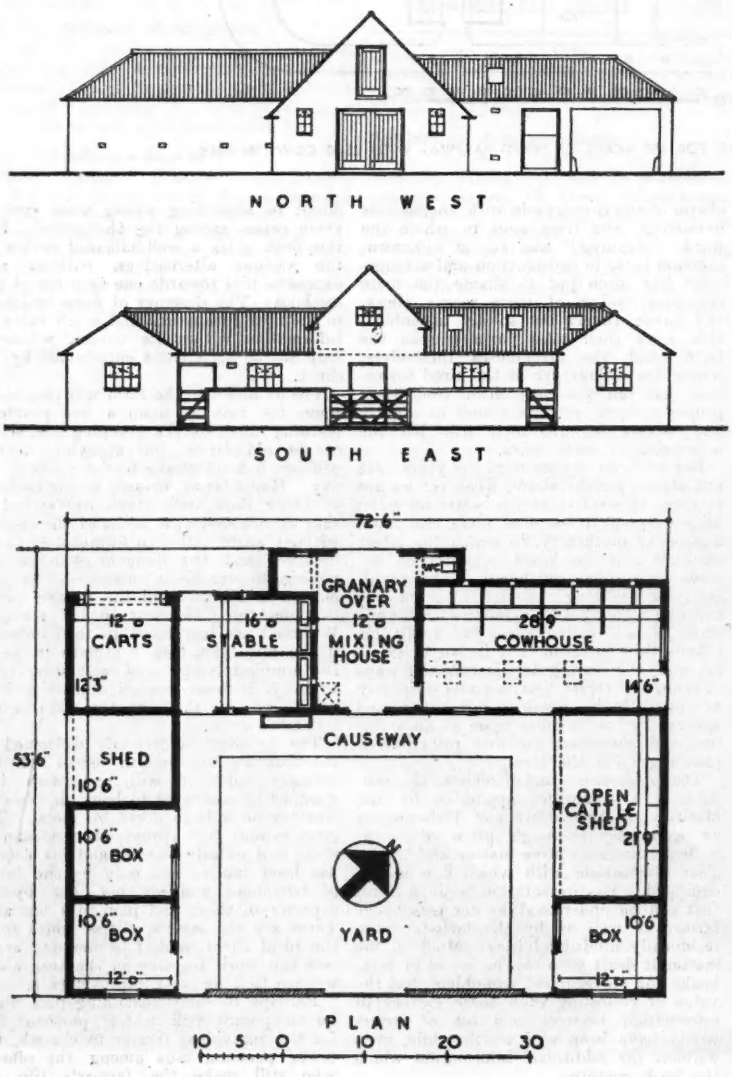
Mr. Briggs states that he has walked or cycled over the great part of the areas he has dealt with, and by so doing has achieved an intimacy with the villages and towns that the more rapid motor might have made impossible. Anyone reading this book by a winter fireside will sigh for the days of Spring and Summer, when one can take to the roads and footpaths again, with Mr. Briggs's book for companion and guide.

If there is one slight criticism to make it is that there is no index by which it is possible to turn back to find again the passage that deals with a favourite village or monument.

The pride in the county is deep-seated in most Englishmen; it is something different from, but contributory to, that love of country which in its quieter aspects is the foundation of all real patriotism.

Our social structure, since the Civil War, has largely centred round the county families; an agricultural aristocracy as compared to the urban aristocracy inaugurated by the French kings; and though all aristocracies are somewhat in eclipse to-day, the values they express are deep rooted. We see again that county pride manifested in the institutions of the county regiments; and other aspects of this regional life are to be observed in the growth of county museums and county councils.

It is amazing how much Mr. Briggs has observed in his travels, both of old and



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BUILDINGS FOR THE SMALL FARM (50-100 ACRES) FOR GENERAL FARMING. (See page 473.)

* Published by Herbert Jenkins, price 15s.

new, and how much he manages to record. Of the modern buildings, he deals with Liverpool Cathedral, and the new buildings for the University of London, the Rylands Library at Manchester, and many other notable achievements by modern architects. Neither does he confine himself to the larger structures, but has time to glance at smaller buildings such as the lovely little church which Bentley built at Watford.

Here is an inspiring guide to regional England, past and present, on a county basis; well documented by a series of clear and concise maps, and admirably and profusely illustrated by the author's pen-and-ink sketches, which must have given him as much delight to make as they will give his readers to study. It is a book that can be safely recommended to both architect and laymen alike, in the confident expectation that it will play its part in preparing for the right solution to some of the major problems of to-day.

VISUAL PLANNING AND THE CITY OF LONDON

LECTURE AT THE ARCHITECTURAL ASSOCIATION

"ALTHOUGH smoothness is the ground work of beauty yet roughness is its fringe and ornament, and that which preserves it from insipidity. One particular charm of smoothness is that it conveys the idea of repose. Roughness, on the other hand, conveys that of irritation, spirit and variety. Repose is always used in a good sense, as a state if not of positive pleasure at least of freedom from all pain and uneasiness, irritation almost always in an opposite manner; and yet, contradictory as it may appear, we must acknowledge it to be the source of our most active and lively pleasures. Intricacy might be defined as that disposition of objects which, by a partial and uncertain concealment, excites and nourishes our curiosity. Any winding road must necessarily have some degree of intricacy; but in a dressed lane every effect of art seems directed against that. The whole has such an appearance of having been made by a receipt that curiosity—that most active principle of pleasure—is almost extinguished. If I were obliged to determine between insipid congruity and incongruity which produces striking effects, I should not hesitate in preferring the latter. The great point is to mix, according to circumstances, what is striking with what is merely pleasing."

The above quotations are from a work published at the close of the eighteenth century, their author being Uvedale Price, an amateur landscape gardener. MR. NIKLAUS PEVSNER quoted them in the course of an address on "Visual Planning and the City of London," given on Tuesday, November 27, at 36, Bedford Square, W.C.1. They might be regarded as a text on which he based his lecture. Mr. Graham Dawbarn, F.R.I.B.A. (President of the Architectural Association), was in the chair.

Mr. Pevsner said the industrial revolution had almost completely submerged this country, and not much had been left of buildings that had preceded it. Illustrating his remarks by lantern slides, he cited the colleges at Oxford and Cambridge as examples of early work yet remaining. Such work was, he said, intricate and varied, and the variety extended both to the planning and the individual buildings. It was incongruous to place gothic buildings in contrast with classic, but in this case the effect was pleasing. He contrasted the university colleges with the Ecole Militaire in Paris, formally logical and with spectacular wings on both sides. The Champs Elysées was another example of the French, as distinguished from the informal English plan. Wren had tried to impose a formal plan on the City of London. That plan would have broken away from the tradition of this country. Wren had come to see this, and in his later work had shown a very sensitive feeling for the London which he had to plan; and had built in a free and varied way. Forms of all kinds were to be found in his church spires, ranging from severe classic to gothic. This free mixing of contrasts was carried further by Vanbrugh, in whom it became almost irritating. Vanbrugh had begun landscape gardening. His building might be as formal as a Palladian mansion, but by placing it in front of an undulating piece of water he created a sense of informality. This sort of contrast appeared in English towns.

The most striking piece of planning in London was that of the Inns of Court. These, like the colleges at Oxford and Cambridge, were groups of buildings around grass. The main contribution of London to European town planning was the square. This had begun with Inigo Jones's Covent Garden and had been followed by other squares throughout the West End. Each such square was a unit in itself, but within it the houses were not necessarily of one shape. They were similar but not identical as those in the Place Vendôme were; and such things as the three large open spaces in Nancy following one axis were not to be found in London. Regent Street corresponded with the Champs Elysées. Its buildings were classical, but the individual blocks had individual character and there was a good deal of deliberate contrast between them.

Britain's Contribution to Planning.

Bath was the best surviving example of civic planning in this country, but even there the planned groups of buildings did not follow one axis as would be expected in classic planning. In Bath, Brighton, Cheltenham or anywhere else you found the deliberate grouping of nature and architecture. Usually you also found that the houses, although of one type, were not exactly similar. Two movements that had originated in this country had influenced the whole world. One was the picturesque or landscape movement of the eighteenth century, and the other the Garden City or Garden Suburb movement of forty years ago. In the eighteenth century movement the attempt had been made to apply to the town Price's dogma that the great point was to mix what was striking with what was pleasing. The garden city idea was to introduce the picturesque into the town. The square introduced a hedgehog of picturesque planning; but otherwise left the town to itself; in the later move the town was left alone while garden cities or garden suburbs were made outside. There was the possibility of applying this informal planning to the City of London. Metropolitan planning was primarily social planning, but the best social planning might not secure aesthetic results, and while we wanted a healthy city we also wanted something for the eye to enjoy. In the Royal Academy plan there had been too much regard for symmetry. It was not in accord with English tradition and, morever, it was not the right functional approach.

Modern architecture confronted the architect with a different problem from the one which confronted the architect of the nineteenth century. It was now necessary to consider the use of the building, not merely to design façades; and the outcome of this had been the predominance of informal asymmetrical planning. If we asked what was the City, what happened around the Bank, we found that most of the business was transacted by people walking short distances to meet each other, standing about or meeting in pubs and at lunch. This was a pedestrian system of contact, and the right functional approach was to keep fast traffic away, have service roads inside, and precincts with pedestrian links connecting them.

Even before the war the City was losing trade after trade. These were going to the West End. He thought the reason for their going was the sheer grimness, blackness and bleakness of the City as it had been and would still be if the original plan for the City of London was carried out, even with the improvements suggested. A very complete scheme would be necessary to give a new lease of life to the City of London, and the appointment of Dr. Holden and Mr. William Holford seemed to indicate that the stars were favourable.

MR. H. S. GODDHART-RENDEL, in the course of a speech proposing a vote of thanks, said he was sure Mr. Pevsner had more or less laid down the doctrine of the future. Trying to make many buildings look like one, forcing them into a symmetrical shape, was extremely artificial and was against English tradition. The City plan was entirely on wrong lines, trying to force London to be something it never could be and which, if achieved, would not be good of its kind. The emphasis Mr. Pevsner laid on London being a place for pedestrian traffic was most interesting.

MR. HUGH CASSON seconded the resolution.

MR. HENRY BRADDOCK said the ideas put forward by Mr. Pevsner were not strange: the principles were those which he (Mr. Braddock) tried to follow in his work as an architect. What was basically Mr. Pevsner's idea? It was the recognition of the fact that the human mind had a limit of perception. What their lecturer had told them about was the humanisation of architecture. It was an important matter.

MISS ROSENBERG said she did not believe pedestrian traffic alone was the really important thing. Most business men had cars. These must be parked somewhere, and means must be provided for their ready access to buildings.

Another speaker said that axial planning was not scientific. Only things that moved, like animals, had symmetry. A plant was not symmetrical, and a town grew like a plant rather than like an animal.

The vote of thanks was unanimously accorded, and Mr. Pevsner replied to the discussion.

COMING EVENTS

Tuesday, December 18.

INSTITUTE OF PLUMBERS. Council Meeting. 81, Gower-street, W.C.1. 10.30 a.m.

INSTITUTION OF CIVIL ENGINEERS. Messrs. G. Graham and F. E. Martin on "Heathrow Airport: Concrete Paving." Great George-street, S.W.1. 5.30 p.m.

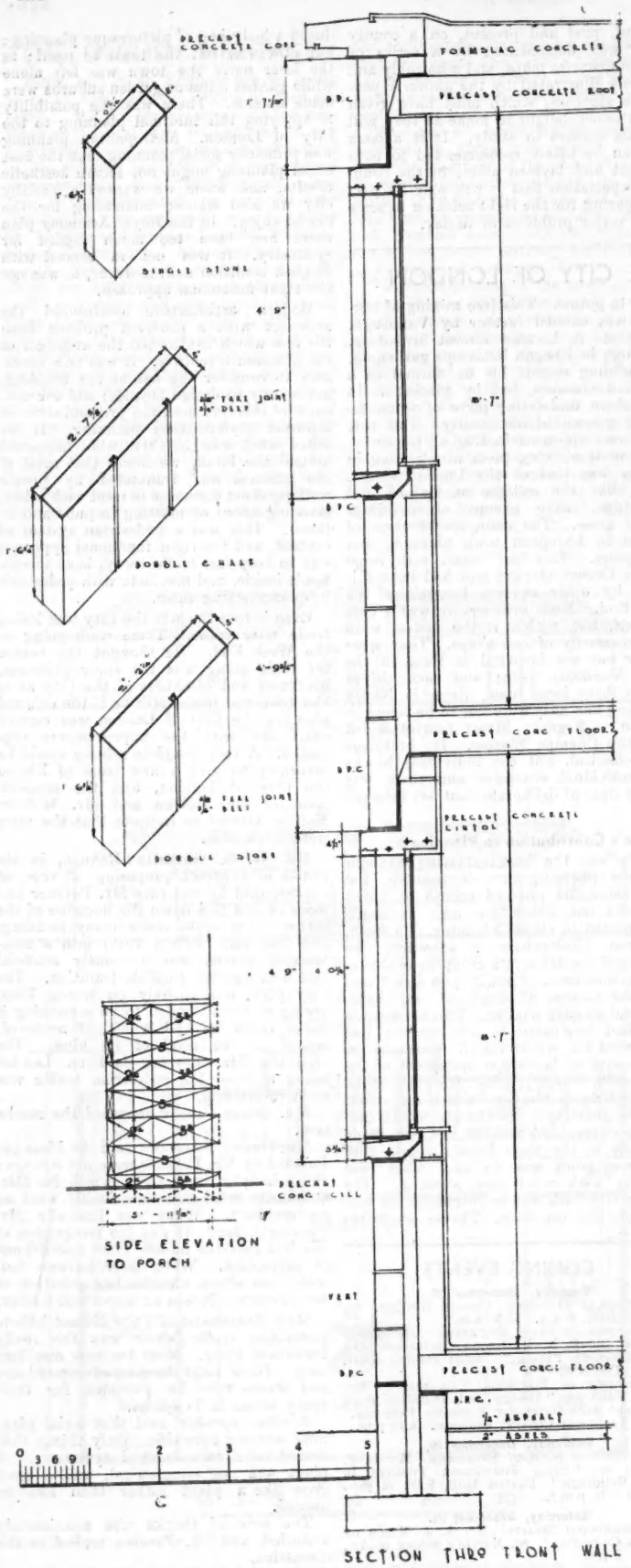
INSTITUTION OF ELECTRICAL ENGINEERS. Mr. F. C. Fuke on "Design and Installation of Electrical Accessories for Domestic Purposes." Royal Technical College, Glasgow. 6.15 p.m.

Thursday, December 20.

INSTITUTION OF SANITARY ENGINEERS. Mr. L. F. Cooling on "Some Foundation Troubles in Small Buildings." Caxton Hall, S.W. 6 p.m. (tea at 5.30 p.m.).

Saturday, December 22.

ECCLESIOLOGICAL SOCIETY. Mr. A. J. Mason on "Wells Cathedral." St. Martin's School of Art, W.C.2. 3 p.m.



A NEW TECHNIQUE OF STONE CONSTRUCTION

EXPERIMENTAL HOUSES AT POLLOK, GLASGOW

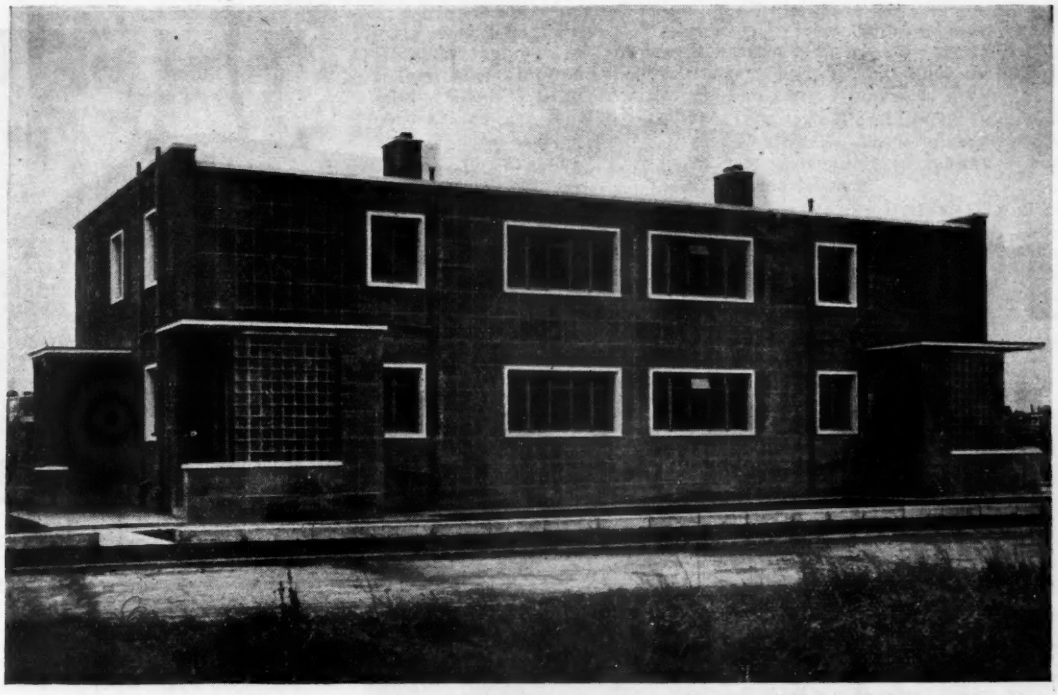
SINCE THE EARLIEST TIMES, STONE HAS BEEN Scotland's traditional building material. Between the two wars, however, other materials were becoming increasingly popular both for houses and other buildings. This was not due to any public reaction against stone as a building material; it resulted from the fact that stone was proving the more costly method. The cost of building in stone does not lie, however, so much in the price of the actual material as in the labour involved. Indeed, stone straight from the quarry is no dearer than mass concrete. But although it can be sawn on machines, moulded heads and sills must be worked by the mason.

The Scottish Freestone Quarry Masters' Association has adopted a suggestion made by Glasgow's Director of Housing, Mr. Ronald Bradbury, Ph.D., F.R.I.B.A., A.M.T.P.I., for a new method of masonry construction which it is expected will be the cheapest possible method of using stone for house building. This new technique has been tried out on a block of houses at the Pollok Estate of the Glasgow Corporation. The experiment has had a two-fold purpose. It has enabled a practical test to be made of the structural stability of the new method, which has proved extremely successful, and it has also enabled costs to be worked out. These show that the stone front of a house, using this cheapest method, will, of course, still be dearer than a brick front. To set against this, however, are the lower maintenance costs which can be expected, and the fact that a further trade, namely the mason, can be utilised on house building.

The new method may be described briefly as follows: All the stones used are of unit size, 1 ft. 1 in. wide by 1 ft. 6¾ in. high, so as to course with the brick backing. Stones can be single units or up to five units in breadth. Similarly, they can be either one unit or two units high. The vertical joints, unlike ordinary masonry, are straight, giving the finished wall the appearance of a chequer board. Where a stone is more than one unit wide or deep, a false joint is cut mechanically into the surface of the stone so as to keep the pattern regular. This scheme of standardisation enables quarry masters to cut the stone from the quarry in such a way as to minimise wastage. Moreover, since the whole of the work, including the cutting of the false joints, is carried out by machines, no hand labour, the most costly item of all, is used in producing the finished stones.

Since it is expensive to work mouldings, heads and sills by hand in stone, these items in the new technique are made of precast concrete, which can be readily moulded to any desired shape. This cast stone could, of course, be made with stone dust and coloured cement, so as to match the natural stone, but, in the experimental block, it has been thought best to use a different colour, so that the precast concrete window and door surrounds contrast pleasantly with the red sandstone. The walls are built in two leaves, the outer leaf consisting of the stone-standardised units 5 in. thick, and the inner leaf of normal 4½-in. brickwork, the two leaves being tied together with ordinary metal cavity walling tiles.

While red sandstone from Dumfriesshire has been used for the experiment, there is no reason why other stones should not be used for this method of construction. The pattern of the jointing gives a freshness and modernity to the stonework which is in sympathy with modern design trends.



HOUSES FACED WITH STONE ON THE POLLOK ESTATE, GLASGOW

RONALD BRADBURY, Ph.D., F.R.I.B.A., A.M.T.P.I., HOUSING DIRECTOR. (See facing page.)

WAR DAMAGE REPAIRS IN LONDON

M.O.H. NEW ARRANGEMENTS

THE Minister of Health, Mr. Aneurin Bevan, announced this week that (1) cost-plus contracts for war damage repairs are to be brought to an end; (2) the Essential Work Order will cease to apply to war damage repairs in the London Region after January 17; (3) the force of 147,000 men on war damage repairs in London is to be gradually reduced, so that most of the 40,000 building workers from the provinces can go home to build new houses.

Mr. Bevan said that 170,000 building trades operatives are at work in the London Civil Defence Region on various kinds of housing work for local authorities, ranging from war damage repairs to the erection of temporary houses and of new permanent houses. The emphasis on war damage repairs in London is now steadily turning to an emphasis on new building.

There still remain in London 39,000 C (b) houses (seriously structurally damaged and uninhabitable) awaiting repair; 575,000 occupied houses have had some measure of repair and need further work on them to bring them up to a standard of reasonable comfort.

Cost-Plus Contracts.—All war damage repair work was done on a cost-plus contract; but local authorities have been encouraged to turn to fixed-price contracts on " seriously damaged " work : There are now nearly 1,400 of these houses being repaired on contracts other than cost-plus. This is now to be speeded up. Local authorities may not now take on any additional contractors on cost-plus contracts for war damage repair of any sort. In the repair of C (b) houses, existing cost-plus contracts will run their course, and will then be replaced by fixed-price contracts. Consideration is now being given to the preparation of a form of fixed-price contract suitable for the less seriously damaged houses.

Provincial Labour.—The provinces came to the aid of London magnificently during the flying bomb attacks. It is now necessary, to ensure a proper spread of new house building throughout the country, that building trades operatives should go back to their home districts. In order to encourage this, the following steps are being taken : (a) The Essential Work Order, which applies to war damage repairs in the London Civil Defence Region until January 17, 1946, will not be renewed; (b) where provincial contractors desire to return home with their men, this return will be facilitated. In addition, individual operatives desiring to return home may now apply to the National Service Officer, and permission will normally be granted.

Scope of Repair Work.—The scope of war damage repair work to be undertaken by local authorities has been redefined in the light of present circumstances. Local authorities will issue a notification to householders where they have carried out work to the point at which the house is reasonably comfortable, although there may still be a substantial amount of further work to be done. This work will be arranged by the individual owner with private contractors as opportunities and the availability of labour and materials make possible. This will enable local authorities to concentrate their attention on work that provides additional family accommodation.

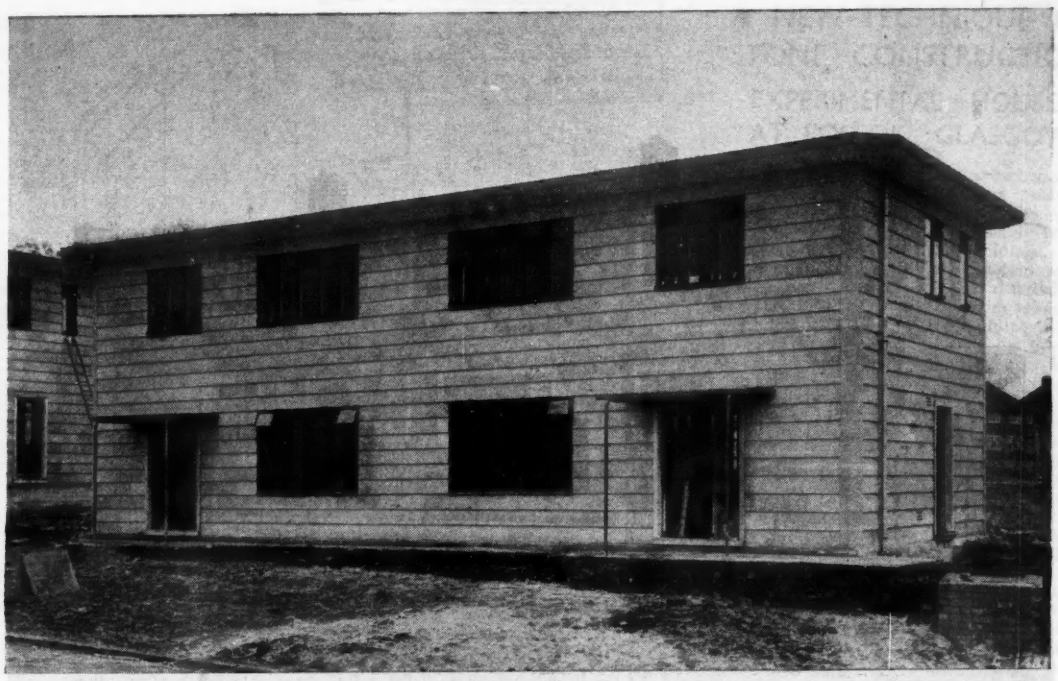
The Minister stated that houses severely damaged and unoccupiable are now being restored to use at the rate of nearly 700 weekly, providing, on the average, accommodation for about 900 family units.

Minister's Conference with Local Authorities.

The Minister of Health explained these decisions at a conference last week with representatives of the 96 local authorities in the London Region. He said that 31,775 temporary houses have been allocated to the London Region, and 3,905 of these are erected. Where local authorities have sites ready and temporary houses cannot be supplied for some time, they may wish to change over to permanent housing. Mr. Bevan is prepared to consider such suggestions.

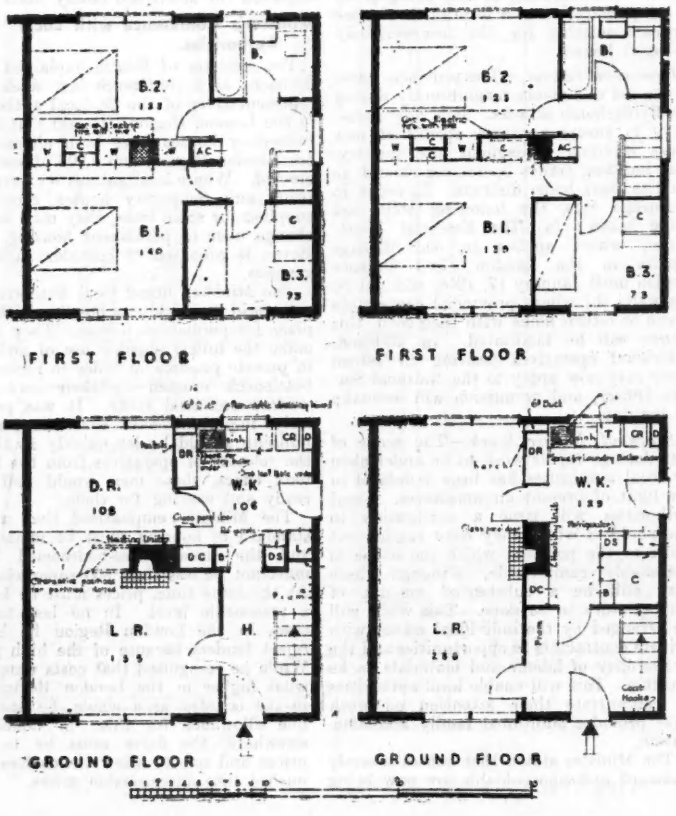
The Minister urged local authorities to get ahead as quickly as possible with their plans for permanent houses. They should make the fullest possible use of architects in private practice in order to remove the bottleneck created by their own overworked technical staffs. It was particularly important that contracts for new building should be let quickly so that as the releases of operatives from the Forces took effect, these men would find work ready and waiting for them.

The Minister emphasised that a good standard of housing must be maintained, and the usual three-bedroomed houses must not be less than 900 superficial feet. At the same time, prices must be kept at a reasonable level. In no less than 15 cases in the London Region he had to reject tenders because of the high prices. While he recognised that costs were somewhat higher in the London Region than in the country as a whole, he had made due allowance for this; in London, as elsewhere, the drive must be to lower prices and not to allow themselves to be pushed into unreasonable prices.



A GENERAL VIEW OF THE COMPLETED SHELL OF A PAIR OF THREE-BEDROOM HOUSES READY TO RECEIVE PAINTING AND INTERNAL FINISHINGS.

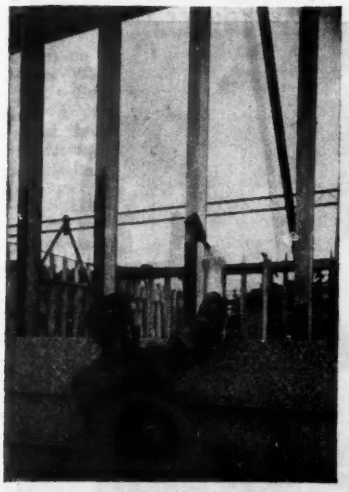
THE "AIREY" PERMANENT PREFABRICATED HOUSE



PLANS OF TYPES "IE" (LEFT) AND "IG," TAKEN FROM M.O.H. CIRCULAR 182/45, ON WHICH THE "AIREY" SYSTEM HOUSES WILL LARGELY BE BUILT.

THE "AIREY" SYSTEM OF HOUSE construction comprises essentially precast concrete external wall-posts clad with precast vibrated concrete slabs tied back to the posts and lined with plasterboard or similar wallboard. Erection is speedy and provides a structure which can be erected "dry" with a minimum portion of skilled labour. The structure is designed with a flat roof, but can be adapted to take a pitch roof.

FRAME DETAILS.—4 in. by 2¼ in. precast concrete posts (with a reinforcing tube passing through them) one storey high are erected at 18 in. centres, and held in position by the floor beams; the external cladding is then added. The posts of the upper storey are connected to the corresponding posts of the lower storey by projecting dowel tubes which fit inside the reinforcing tubes of each post of the lower storey. The roof joists again connect up these posts by being bolted to them—two bolts to each end of the joist. Timber floor and roof joists may be used, but in the



APPLYING THE BITUMINOUS COMPOUND TO THE POSTS READY TO RECEIVE THE SLABS. NOTE THE SURFACE TEXTURE OF THE FINISHED SLAB, IN THIS CASE QUARTZITE AND DERBYSHIRE SPAR.

Ministry of Works houses light lattice steel joists have been used to ensure timber economy.

FOUNDATIONS.—Normal building practice is carried out for the foundations.

EXTERNAL WALLS.—Precast vibrated concrete wall slabs of weatherboard section are used. The slabs are 3 ft. long by 9¾ in. deep, cast in steel moulds, and can be finished with a variety of textures. While the rebated horizontal joints are laid dry, the square vertical joints are "staggered" at each course and are bedded against the posts with a bitumen mastic compound. The slabs are secured to the posts by means of copper wire ties connected to copper hooks cast in the backs of the slabs. These copper wire ties pass round the inside of the posts and their length is such that two turns of a special key are sufficient to hold the slabs firmly in position against the posts. Special metal windows 1 ft. 6 in. wide fit on the face of the concrete posts.

The internal lining of external walls is plasterboard or similar material, backed with fibre-glass, site-fixed to wood battens cast in with the concrete posts.

PARTY WALL.—The party wall is constructed similarly to the external walls, but in two completely independent leaves.

INTERNAL PARTITIONS.—The internal partitions are finished with plasterboard secured to timber fillets on the concrete posts of the spine wall or to the stud partitions.

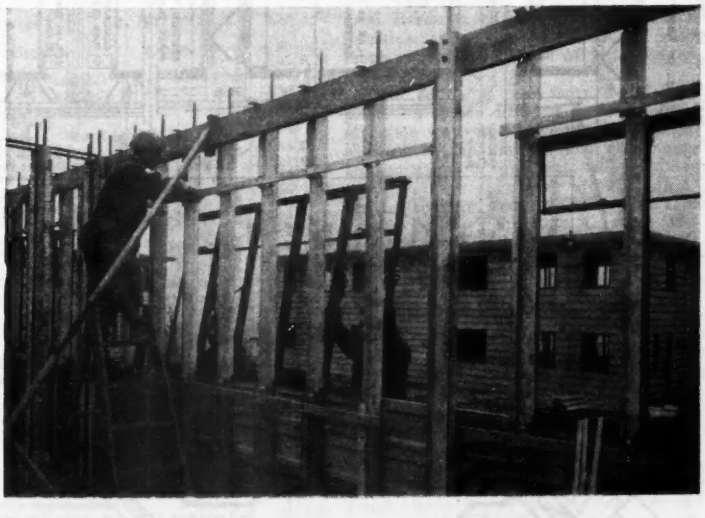
SUSPENDED FLOORS.—The floor joists consist of light steel lattice joists averaging 7 in. deep with timber fillets top and bottom to receive the T. & G. floorboards and plasterboard (or similar) ceiling finish.

ROOF.—When flat (as on Ministry of Works houses) this consists of light lattice steel joists as for the suspended floor with T. & G. boarding laid to a fall of 1 in 60 to receive the bitumen roofing felt finish. Roof insulation is provided by fibre-glass quilt between the structural members and the ceiling finish. The projecting eaves in timber construction with asbestos-cement soffit form a gutter as well as a feature of the building. A pitched roof can be provided.

GENERAL POINTS.—The structure is extremely simple in construction and economical in materials and skilled labour.

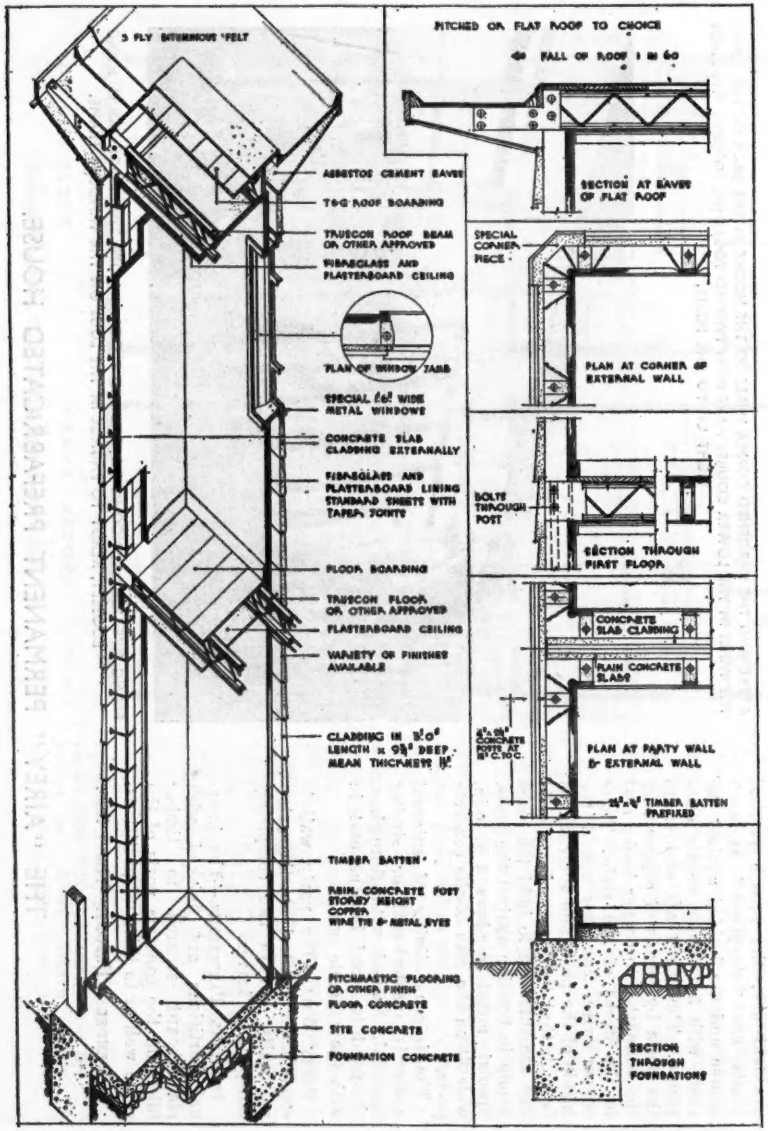
PLANNING AND DESIGN.—The planning is flexible within the 18-in. module of the structural elements. Doors and windows can also be in any position within the module. Variation in external design is possible by the use of different surface and roof treatments.

ATTACHING THE HARDENED COPPER WIRES TO THE HOOKS IN THE BACK OF THE SLABS. THE WIRES IN THE LOWER COURSE HAVE BEEN TWISTED TOGETHER, FORCING THE SLABS TIGHT UP TO THE POSTS.

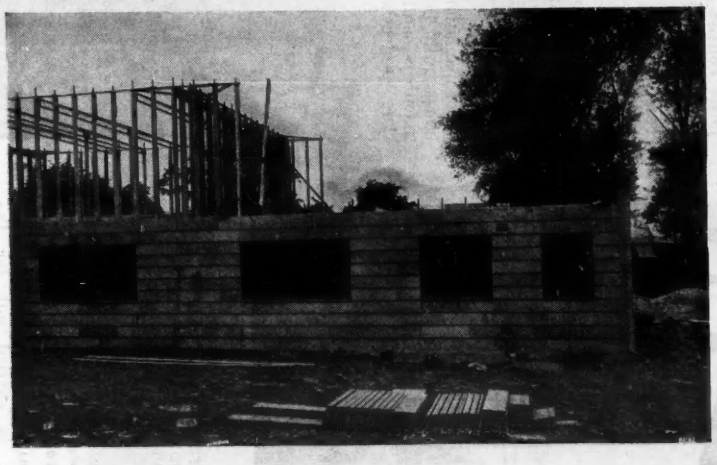


FIXING FIVE-LIGHT WINDOWS TO GROUND FLOOR. NOTE THE HOOK BOLTS HUNG LOOSELY, READY TO ENGAGE IN THE LUGS ON THE WINDOW FRAME.

THE "AIREY" PERMANENT PREFABRICATED HOUSE.


THE "AIREY" PERMANENT PREFABRICATED HOUSE
3 PLY BITUMINOUS FELT
ASBESTOS CEMENT EAVES
T&G ROOF BOARDING
TRUSCON ROOF BEAM OR OTHER APPROVED
FIBREGLASS AND PLASTERBOARD CEILING
PLAN OF WINDOW JAMB
SPECIAL 6ft WIDE METAL WINDOWS
CONCRETE SLAB CLADDING EXTERNALLY
FIBREGLASS AND PLASTERBOARD LINING STANDARD SHEETS WITH TAPED JOINTS
FLOOR BOARDING
TRUSCON FLOOR OR OTHER APPROVED
PLASTERBOARD CEILING
VARIETY OF FINISHES AVAILABLE
CLADDING IN 8'-0" LENGTH x 9 1/2" DEEP MEAN THICKNESS 1/2"
TIMBER BATTEN
REIN. CONCRETE POST STOREY HEIGHT COPPER WIRE TIE & METAL EYES
PITCHMASTIC FLOORING OR OTHER FINISH
FLOOR CONCRETE
SITE CONCRETE
FOUNDATION CONCRETE
PITCHED OR FLAT ROOF TO CHOICE
FALL OF ROOF 1 in 60
SECTION AT EAVES OF FLAT ROOF
SPECIAL CORNER PIECE
PLAN AT CORNER OF EXTERNAL WALL
BOLTS THROUGH POST
SECTION THROUGH FIRST FLOOR
CONCRETE SLAB CLADDING
PLAIN CONCRETE SLAB
PLAN AT PARTY WALL & EXTERNAL WALL
TIMBER BATTEN PREFIXED
SECTION THROUGH FOUNDATIONS

Above : GENERAL VIEW FROM THE INSIDE SHOWING EXTERNAL WALLS NEARLY COMPLETED TO FIRST-FLOOR LEVEL. NOTE THAT VERTICAL POSTS ARE CARRIED THROUGH THE WINDOWS, THEREBY AVOIDING STRUCTURAL LINTELS. *Below :* PLACING FIRST-FLOOR POST ON THE DOWEL WHICH PROJECTS FROM THE GROUND-FLOOR POST. *Left :* CONSTRUCTION DETAILS.



THE "AIREY" PERMANENT PREFABRICATED HOUSE

MODERN METHODS OF HOUSE CONSTRUCTION

MR. JOHN W. LAING'S PAPER TO CHARTERED SURVEYORS

A PAPER on this subject was read by MR. JOHN W. LAING, F.I.O.B., to the Chartered Surveyors' Institution on December 3. Mr. Laing said :—

Essential factors in a house are cost, accommodation, comfort—and in that we include health—durability, appearance and surroundings.

COST.—Speaking generally the cost of a *Brick* house is the same as *Timber*, though the latter may be slightly less. Occasionally we have been asked to tender alternatively for timber and brick. In some cases the brick house is as cheap as the timber and in other cases we have known the timber to be 10 per cent. cheaper than the brick house. If the building industry is normal, with bricks plentiful and a good supply of industrious bricklayers, it is found that a *Concrete* house costs slightly more—say 5 per cent. more—than brick. But when bricks and bricklayers are in short supply it increases the cost of a brick house and at such times the concrete house is a little cheaper than brick. A *Steel* house costs about 10 per cent. more than a brick house.

There is still uncertainty with regard to the cost of an *Aluminium* house, though I think we may take it that it will be decidedly dearer than steel. All comparative costs are subject to fluctuations due to local conditions or variations in the supply of materials, and also the different forms of concrete or steel construction do vary in price.

Prefabricated houses are dearer than houses built on the site. This is rather disappointing, but it is in accordance with our own experience, and when visiting America just before the war we found that six or so of the large firms which had started mass production of prefabricated houses, discovered they could not, on the whole, compete successfully with houses traditionally built. And that was in a country where everything lends itself to prefabrication, having a plentiful supply of timber, which is a most suitable material for this type of construction and mass production in a factory; and where also the site-built house is handicapped by higher rates of wages paid to the site operatives. The same high rates of wages would, no doubt, apply in the factory, but it should be expected that machinery would reduce the hours considerably, thus giving the factory-produced article an advantage. Further, our experience in Britain with regard to prefabricated temporary houses has confirmed that prefabricating a house, or sections of a house, and transporting to the site and erecting there, increases the cost.

ACCOMMODATION.—Having spoken of one of the essentials in house building—i.e., cost, we now turn to the matter of accommodation. All methods of construction are about equal in this respect, for although certain houses, such as steel, cannot give the variety of accommodation provided by the traditional house, they have an advantage in that as there are fewer types the designs of these are well considered.

Regarding the question of *Comfort*; when non-traditional houses were built 25 years ago, the promoters were proceeding with new forms of construction and working somewhat blindly in a new sphere, whereas in the present-day all new forms of construction are guided and shepherded by the Building Section of the Department of Scientific and Industrial Research, which leads the promoters safely past many of the pitfalls. In using the new methods and materials that are available, and adopting the recommendations of the Department, a high standard of comfort is provided by the non-traditional house—in some cases an even higher standard than the traditional.

Concerning *Durability*, it is necessary that any form of construction shall be enduring and shall be easily maintained, and it is well to recognise that some forms of construction which may be quite suitable for occupation by elderly people, are not ideal for a family of boisterous children. It needs to be borne in mind that a lining of thin board, such as plasterboard, fibreboard, or asbestos sheeting, with a cavity behind, does not compare for permanent reliability with a strong plaster finish on a substantial brick or concrete wall. Also, in the matter of fire resistance, fibreboard needs to be kept well painted to make it reasonably resistant, and even then it does not compare with traditional construction. And with regard to vermin infestation, a plaster finish on a substantial brick or concrete wall is less liable to vermin infestation than thin boards with a cavity behind.

As regards *Appearance*, I think we are agreed that in house building nothing surpasses a hand-made clay brick, though these are closely followed by many forms of machine-made rustic brick. Some forms of concrete houses, finished with a Tyrolean roughcast, are almost, if not quite, equal to brick in appearance. Owing to rigidity of design, the steel and aluminium houses will have a less attractive appearance, but the houses will be architecturally designed, and finished in pleasing colours, so that if the site planning is good, metal houses should be of very satisfactory appearance.

All forms of house construction can result in either beautiful or ugly dwellings and care is certainly needed in design and layout. An attractive appearance being one of the essentials, it is fortunate that this can be obtained by careful, thoughtful designing and planning by trained and experienced house architects at practically little extra cost.

The question of *Surroundings* is important. A good plan and a good layout ensures lasting value, and we would instance this by mentioning the case of a house built by my grandfather 98 years ago. This was sold by our family 40 years after it was built, for £150, and we observed that it was resold some years ago for £850. In that case there was a combination of good planning, equal to anything that could be planned now, substantial construction, and set amidst beautiful surroundings. This emphasises the advantage of a good house plan and a good district layout plan. We can hardly imagine any circumstance that would cause housing in Letchworth, for example, to depreciate in value.

At the present time the shortage of skilled men and of certain materials, and the probability that within a short time there will be unemployment among unskilled men, and also in industries such as the engineering industry, which has developed to a very great extent during the war, but must now reduce its ranks—makes it necessary that alternatives to the traditional forms of construction should be used.

THERMAL INSULATION OF BASIC MATERIALS.

Material.	*Thermal Conductivity per inch for 1° F. diff. in Temp. = K.*	*Thermal Resistance.*	*Value of "K" for Practical thickness.*		*Resistance.*
			in.		
Asbestos Cement ..	2.70	0.37	¼	0.8	.09
Brick Common ..	5.00	0.20	4½	1.1	.90
			9	.55	1.80
			13½	.37	2.70
Brick Facing	9.20	0.11	4½	2.05	.49
Concrete :					
Gravel 1-2-4 ..	7.00	0.14	3½	2.00	.49
Clinker	2.80	.36	3½	.80	1.26
No-Fines	5.50	.18	3½	1.57	.63
Foamed Slag ..	2.20	.45	3½	.63	1.58
Cement Mortar ..	12.00	0.08	½	16.00	.06
Glass Wool	0.27	3.70	1	0.27	3.70
Plaster Gypsum ..	3.30	0.30	½	6.60	0.15
			¾	4.40	0.23
Do. on Metal lath			¾	4.40	0.23
Do. on Wood lath			¾	2.50	0.40
Do. Lime on Wood			¾	2.00	0.50
Plaster Board			½	3.73	0.27
Ruberoid Roofing built up to ½ in. ..			⅜	3.53	0.28
Sawdust and Shavings..	0.41	2.44	2	0.21	4.88
			3	0.14	7.32
Fibre Board—Celotex..	.33	3.00	½	.66	1.50
Donnaconna ..	.37	2.70	½	.74	1.35
Essex	.53	1.90	⅝	2.83	0.35
Lloyd Board ..	.34	2.95	⅛	1.10	0.92
Tentest	.38	2.63	½	.76	1.32
			⅜	.62	1.65
Corrugated Steel :	Ignore conductivity of metal: use surface coefficients only adding 50 per cent. for added area of corrugations.				
Wood	1.00	1.00	3	.33	3.00
Airspace over ¾ in. ..	1.10	0.91			
Surface Co-efficients—					
Internal	1.65	0.61			
External	6.00	0.17			
Cabot's Quilt—					
9.4 lb. per c. ft. ..	.316	3.16	½	.63	1.59
			¾	.42	2.35
13.4 lb. c. ft.	.341	2.93	¾	.68	1.47
			¾	.46	2.18
Slag Wool or Silicate Cotton	.25 to .30	4.00 to 3.33	1	.25 to .30	4.00
			2	.13 to .15	8.00
Asbestos Flexible Felt			½	.56	1.8

MODERN FORMS OF CONSTRUCTION

Before proceeding to give a more detailed view of the modern forms of construction, I should like to express the indebtedness of the building industry to the Department of Scientific and Industrial Research (Building Section) for its valuable assistance in advancing knowledge regarding the use of both old and new materials.

Prior to going into more detailed explanation of the different methods of construction we would refer you to the chart, showing in the first columns the thermal transmittance of different walls, referred to as U. We draw your attention in the first place to item No. 3, the 11-in. cavity wall, which has a U value of .3 to .34, and we will use this as a basis for comparison with others.

Item No. 4.—A timber frame, covered externally with felt and corrugated iron; covered internally with asbestos cement sheeting, and the space filled with sawdust and shavings—is a surprisingly efficient and economical form of construction, having a U value of .17.

Item No. 8, constructed as No. 4, but with a sheet of aluminium foil, instead of sawdust. This has a U value of .24.

Item No. 10, which is the same construction as No. 8, but lined with fibreboard, instead of ¼-in. asbestos, has a U value of .18.

FLOORING.—The traditional floor consisting of t. and g. boarding nailed to joists, with a ventilation space underneath, is at present expensive and the

heat losses are considerable. If well ventilated, it has a U value of .40. A flooring, therefore, recommended by the *Housing Manual*, is a layer of concrete, wood fillets thoroughly creosoted, and boarding, which is economical and warm.

The flooring we most strongly recommend, however, is concrete and wood blocks. This has a U value of .15. Unfortunately is costs about £10 per house more than the aforementioned floor, but it avoids the necessity for linoleum and is safe from the danger of dry rot. Other floor coverings could be pitch mastic or "Granwood." Pitch mastic on concrete is the cheapest of floors.

ROOFS.—The traditional roof, consisting of plaster ceiling, roof space, and a covering of tiles or slates, with felt underneath, has a heat loss of U .42, but if there is an insulation of 1½ in. of sawdust, or 1 in. of glass wool above the plaster ceiling, the heat loss is reduced to U .17. A flat roof consisting of plasterboard, glass wool, joists, ¾ in. boarding, two layers of felt and ¾ in. of tarmacadam, also has a heat loss of U.17. It may be of interest to compare the flat roof cost with the traditional. We have frequently made up estimates of the comparative cost, and taking everything into consideration, allowing for a similar insulation of both, and for the cost of gables of a pitched roof, the cost of the tiled pitched roof is no greater than that of a flat roof, and most of us would consider that the appearance of the tiled roof is very much better.

PARTY WALLS.—To avoid the transmission of sound, party walls should have a cavity, whether the walls are of brick or concrete; but a 9 in. solid brick wall, or a 12-in. "No-fines" concrete wall is still accepted without a cavity.

PARTITIONS.—The three most practical forms of partition of which we are aware are :—

1. Clinker or foamed slag concrete slabs, plastered.

2. A studding with plasterboard each side, insulated where necessary by means of felt, or similar, for sound resistance between rooms.

3. A number of layers of plasterboard joined together, making a total thickness of about 1½ in. to 2 in.

There is little difference in cost, but in the first it is necessary to use plasterers, who may be in short supply, and in the latter it is necessary to use plasterboard which is in short supply.

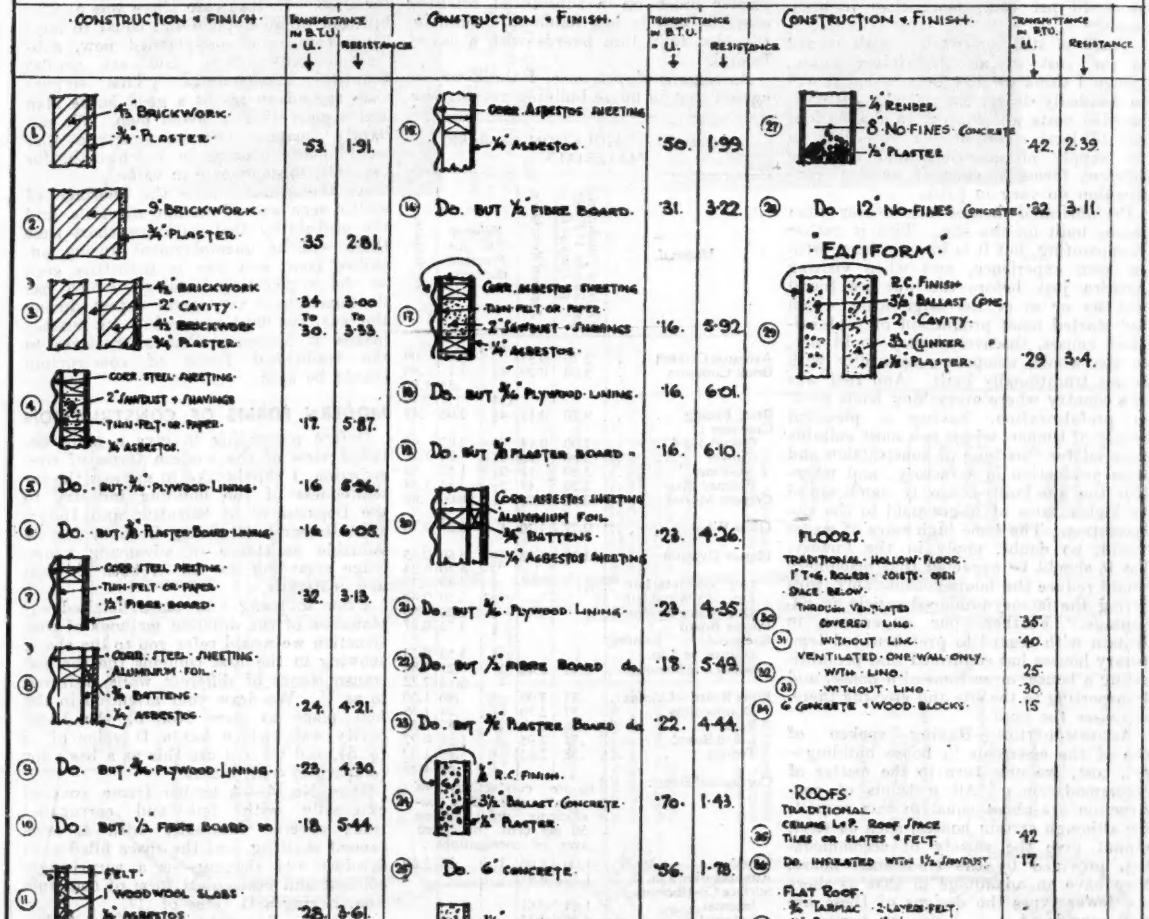
HEATING AND INSULATING

We now contrast the traditional house with the insulated house, calculating the floor at U .15 in contrast with U .4; the walls at U .2 in contrast with U .3; and the roof at U .17 in contrast with U .42.

I quote the following from Mr. Maurice Bland, the heating engineer :—

"It is interesting to consider what fuel saving is effected by improving the insulation qualities of the walls, floor and ceilings of a 900 f.s. house, the type occupied by a small wage earner.

"First, assuming that this is built in the traditional manner, with 11 in.


·THERMAL · INSULATION·
·TRANSMITTANCE · & RESISTANCE· OF· VARIOUS· TYPES· OF· WALL· ETC·
·CONSTRUCTION · & FINISH·
TRANSMITTANCE IN B.T.U. = U. ↓
RESISTANCE ↓
1 ½" BRICKWORK · ¾" PLASTER · ·53. 1·91.
2 9" BRICKWORK · ¾" PLASTER · ·35 2·81.
3 4½" BRICKWORK · 2" CAVITY · 4½" BRICKWORK · ¾" PLASTER · ·34 To ·30. 3·00 To 3·33.
4 CORR. STEEL SHEETING · 2" SAWDUST & SHAVINGS · THIN FELT OR PAPER · ½" ASBESTOS · ·17. 5·87.
5 Do. · BUT · ⅜" PLYWOOD LINING · ·16 6·36.
6 Do. · BUT · ½" PLASTER BOARD LINING · ·16. 6·06.
7 CORR. STEEL SHEETING · THIN FELT OR PAPER · ½" FIBRE BOARD · ·32. 3·13.
8 CORR. STEEL SHEETING · ALUMINIUM FOIL · ¾" BATTENS · ½" ASBESTOS · ·24. 4·21.
9 Do. BUT ⅜" PLYWOOD LINING · ·23. 4·30.
10 Do. BUT ½" FIBRE BOARD Do. · ·18. 5·44.
11 FELT · 1" WOODWOOL SLABS · ½" ASBESTOS · ·28. 3·61.
12 Do. BUT ⅜" PLYWOOD LINING · ·27. 3·71.
13 Do. BUT ½" PLASTER BOARD Do. · ·26. 3·85.
14 Do. BUT ½" FIBRE BOARD Do. · ·21. 4·84.
·CONSTRUCTION · & FINISH·
TRANSMITTANCE IN B.T.U. = U. ↓
RESISTANCE ↓
16 CORR. ASBESTOS SHEETING · ¼" ASBESTOS · ·50. 1·99.
14 Do. BUT ½" FIBRE BOARD. ·31. 3·22.
17 CORR. ASBESTOS SHEETING · THIN FELT OR PAPER · 2" SAWDUST & SHAVINGS · ¼" ASBESTOS · ·16. 5·92.
18 Do. BUT ⅜" PLYWOOD LINING. ·16. 6·01.
19 Do. BUT ½" PLASTER BOARD · ·16. 6·10.
20 CORR. ASBESTOS SHEETING · ALUMINIUM FOIL · ¾" BATTENS · ¼" ASBESTOS SHEETING · ·23. 4·26.
21 Do. BUT ⅜" PLYWOOD LINING · ·23. 4·35.
22 Do. BUT ½" FIBRE BOARD do. ·18. 5·49.
23 Do. BUT ½" PLASTER BOARD do. ·22. 4·44.
24 ½" R.C. FINISH. · 3½" BALLAST CONCRETE · ½" PLASTER · ·70. 1·43.
25 Do. 6" CONCRETE · ·56. 1·78.
26 3½" CLINKER CONCRETE · ½" PLASTER · ·58. 1·73.
·CONSTRUCTION · & FINISH·
TRANSMITTANCE IN B.T.U. = U. ↓
RESISTANCE ↓
27 ½" RENDER · 8" NO-FINES CONCRETE · ½" PLASTER · ·42. 2·39.
28 Do. 12" NO-FINES CONCRETE · ·32 3·11.
·EASIFORM·
29 R.C. FINISH · 3½" BALLAST CONC. · 2" CAVITY · 3½" CLINKER · ½" PLASTER · ·29 3·4.
FLOORS.
TRADITIONAL · HOLLOW FLOOR · 1" T & G. BOARDS · JOISTS · OPEN SPACE · BELOW ·
30 THROUGH VENTILATED COVERED LINO. ·35.
31 WITHOUT LINO. ·40.
32 VENTILATED ONE WALL ONLY · WITH · LINO. ·25
33 WITHOUT LINO ·30.
34 6" CONCRETE & WOOD BLOCKS · ·15
·ROOFS·
TRADITIONAL
35 CEILING L & P. ROOF SPACE · TILES OR SLATES & FELT ·42
36 Do. INSULATED WITH 1½" SAWDUST ·17.
·FLAT ROOF·
37 ¾" TARMAC · 2 LAYERS FELT · ¾" BOARDING · GLASS WOOL · JOISTS · ½" PLASTER BOARD. ·17.
Nov. 1945.

Diagrams and Coefficients of varying types of Thermal Insulation.

cavity walls, plaster ceilings and hollow ventilated floor. For every 100 heat units dissipated, the losses can be considered approximately as follows :—

Floor	18	
Walls	26	
Ceilings	21	
	—	65
Windows, doors and by airchange	35	
	—	100

" Now if the house is built with a solid floor and wood blocks, insulated walls and if the ceilings are covered with 2 in. sawdust, the heat losses are reduced to :—

Floor	7.5	
Walls	17	
Ceiling	10.5	
	—	35

" There is no alteration in the losses from the windows, doors and by air-change.

" The heat losses have been reduced by 30 per cent., and assuming the same internal temperatures are obtained, there should be a saving of 30 per cent. of the fuel and electricity used for warming the house.

" If 3 tons of fuel are consumed per annum for warming and water-heating, when a separate small domestic hot-water supply boiler is used, it is reasonable to assume that half of this is used for warming the house, that is 1½ tons, and that this is supplemented by, say, 300 units of electricity used at different times for warming bedrooms.

" A saving of 30 per cent. of these approximate amounts is :—

	£	s.	d.
1½ tons of fuel at £4 per ton (30 per cent. on £6)	1	16	0
300 units of electricity at 1d. per unit (30 per cent. on the 25s.)		7	6
Per annum ..	£2	3	6

" This amount can be apportioned as follows :—

	£	s.	d.
By floor		15	3
„ walls		13	0
„ ceilings		15	3
	£2	3	6

" It may now be said that the traditional method of warming a house of this type and heating the water, consists of :—

" An open fire in the living-room and a small hot-water supply boiler in the kitchen. Although the thermal efficiency of these units is not high, they have several merits :—

" The maintenance cost is low, the simple boiler is not easily damaged and its operation is understood by most people. The fire in the living-room need never be lit in the summer months."

MR. LAING continued : The annual saving of £2 3s. 6d. calculated on a 60-years' life for the house, at a 4 per cent. interest rate, equals a capital value of £49 4s. Of this more than one-third is saved on the floor, less than one-third on the walls, and more than one-third on the roof. We consider that the one-third on the floor should be saved, because in every case, with the exception of a very unlevel site, it can be accomplished at very little extra cost. The one-third saved in the roof should be made use of, as by insulating with either sawdust or glass wool, it can be accomplished at a very small extra cost. In the case of the walls, however, we do not think the insulation cost is justified, as in most cases it necessitates the use of a type of wall which would not withstand hard usage over a long period.

HEATING.—Much attention has been given during recent years to the improvement of the heating system for the small type house. We may take it that generally the most economical form of heating is by solid fuel. An essential in the use of solid fuel in the world of the future is that it shall be smokeless.

Improved fires have been designed in recent years which consume coke, and similar fuels, readily. This has been accomplished by a change in design of the fire-back, which by its depth provides that the fuel is in a great measure surrounded by heat-radiating fireclay, and this, which entails no extra cost, causes the coke to burn more easily than with the old type of fire-back. As one looks at some of our manufacturing towns, with grime apparent everywhere, and compares it with places free from smoke, one realises it is a prime duty in building and manufacturing to avoid the emission of smoke, and this can be accomplished without extra cost.

The next question to consider is the comparative merits of an open or closed fire. An open fire gives a fuel efficiency of about 15 per cent. to 25 per cent., whereas a closed fire gives a fuel efficiency of 40 per cent. to 50 per cent. The scientists tell us that a much higher fuel efficiency can be effected even than the latter, and that is so if the design and construction of the fireplace is first class and is maintained as such, and also if the stoking is given proper attention. In such circumstances the efficiency might rise as high as 60 per cent. Even taking the lower figure, however, the question of the closed fire certainly merits consideration.

As against sheer economy, the open fire has the great advantage of cheerfulness and ventilation, with its resultant bracing effect on health. A reasonable compromise can be adopted in a fire which is closed during the hours when a room is not in use, and opened during the few hours in the day when people are sitting in the room. In addition to heating rooms, it is often necessary that the fire should heat the hot-water boiler.

Comparison of Forms of Heating.

Much attention has been given to the use of convector heating, by which means a certain amount of the heat from the living-room fire is transferred by flues to other rooms, and with a closed fire this process can raise the temperature of two of the bedrooms by 10 degrees. It is necessary to remember that no fire has magical powers, and in heating more hot water and also bedrooms more fuel is required; but apart from fuel consumption, it is a great convenience if one fire can answer a number of purposes.

As against that, however, the fire in a sitting-room is only required for a certain period of the year, and it is necessary that some other system should be installed to provide hot water during the period when the living-room fire is not required. We have adopted three systems :—

1. An independent boiler in the kitchen, which uses solid fuel.

2. Instantaneous gas heater, such as the Ascot.

3. Electric emersion heater.

If a house is occupied by a family, using a liberal supply of hot water, the independent boiler is preferred. But if the house is occupied by those only using it for sleeping purposes and for breakfast, then the second or third alternatives are advisable.

The three systems might be compared as follows :—

1. *Solid Fuel.*—1 cwt. of coal, approximately costing 4s., used in an independent boiler, would provide 250 gals. of water at 140 deg., and in addition would provide heat in the kitchen and in the drying cupboard.

2. *Gas Heater.*—4 therms of gas, also costing about 4s. would provide 250 gals. of water at 140 deg., but would not give heating in the kitchen and in the drying cupboard.

3. *Electric Emersion Heater.* — The same amount of hot water would be provided as in the two former, and with electricity at 1d. per unit would cost about 8s. It would provide heat in the drying cupboard, but not in the kitchen.

If, however, the amount of hot water required was reduced by half—i.e., 125 gals., the cost of coke heating and heating by electricity would be about equal.

As a point of interest we mention the case of a business friend who built 170 houses without providing any system of solid fuel heating for hot water. Within a few years in each house a change over had been effected, as people could not afford any other type of heating the hot water except by solid fuel.

To prevent loss of heat, it is essential in the modern house that the flow and return pipe from the boiler to the hot-water cylinder, and also the hot-water cylinder, should be thoroughly lagged.

The Government has developed an elaborate prefabricated unit, which gives effect to all the foregoing desiderata, and it will have a very high standard of efficiency, but against that it must be remembered that it restricts the planning of a house and in some cases sacrifices comfort in certain of the rooms to permit of its use. It requires consideration, therefore, whether the amount of fuel economy justifies the forfeiting of the most desirable planning, when practically the same results con be obtained by the use of the most modern types of fireplaces, and also of plumbing scientifically planned and lagged.

Alternative Methods of Construction.

Let us now refer to several of the alternative methods of construction which are being adopted, and later consider new details and materials.

Concrete construction can be divided into two categories (*a*) those in which the walls carry the weight, and (*b*) those in which there is a concrete frame clothed outside and inside with suitable sheeting.

The following fall under category (*a*) :—

" *No-fines* " *construction.*—The walls in this case are of concrete, a recommended thickness of 12 in. The aggregate of the concrete varies in size from ⅜ in. to ¾ in. Owing to the lack of all fine material, the concrete is cellular, and coated with render and roughcast the wall is damp resisting. The interior is plastered. The system avoids the use of bricklayers and has been widely used in Scotland with satisfactory results.

" *Easiform* " *construction.*—This consists of an outer leaf of dense concrete, a cavity, and an inner leaf of clinker concrete. The cavity ensures that the construction is dry. Several thousands were built 25 years ago and have proved to be dry and warm. Care is required in construction, and the steel moulds need to be well made so that perfectly true walls result without using skilled men for the work. Bricklayers and plasterers are not required, but should the latter be in abundant supply they could be used for the internal finish. There are now no patent rights in connection with either the " No-fines " or " Easiform " constructions.

Another interesting form of construction in this class consists of precast panels of vibrated concrete, each panel being of a suitable width, about 2 ft. or 3 ft., and 8 ft. high. As such panels were used in the building of concrete ships with good

results, they will be water resisting. The internal lining consists of a non-conductor, such as clinker concrete, glass wool, or similar non-conductor, lined internally with plasterboard or other suitable material. As the units are manufactured in the factory, this system reduces site labour.

Falling under category (*b*) are various forms of concrete framework houses, clad outside with either concrete slabs or brickwork, and inside with a suitable material such as clinker concrete slabs or wood wool slabs.

An interesting form of frame construction is one in which small concrete posts, about 4 in. by 2 in., are erected in the same way as the wood framing of a timber house. The outside is sheeted with thin concrete slabs somewhat like timber weather boarding, and the inside is suitably lined with insulating material and plasterboard, or other like material.

May I remind you that in using concrete for building walls for houses you are using material that has to be compared with brick. One thousand bricks—which is approximately 2 cu. yd. used to be delivered to the site of houses in the London area, pre-war, for about 40s., whereas 2 cu. yd. of concrete put into the foundations of a house cost about 60s. Therefore a clay brick is a very cheap material as compared with cement concrete. To overcome this handicap of cost of bulk material, you will observe that some methods cast the concrete into the walls thus avoiding the labour of building. Other forms of construction precast concrete in light sections and high quality and trust to an insulating material for warmth. It is interesting to observe that the manufacturers of concrete bricks in an endeavour to get their product to compete with clay bricks have a very large frog in the brick to save materials.

The various types of *Steel* houses might be classed under three headings :—

1. A frame is formed of hot rolled steel joists, or stanchions. These are all of substantial thickness.

2. A steel firm has evolved a frame, formed of 3-16 in. hot rolled steel, formed into a lattice work stanchion. This method still preserves the substantial character of the hot rolled steel frame work, and it economises in the use of steel, but increases the amount of labour by forming the small sections into lattices by means of electric welding.

3. The third type has stanchions formed of sheet steel, usually 14 gauge.

All these types are treated to prevent corrosion.. The framing is clad externally with various materials, in some cases 4½-in. brick; others with concrete blocks; others with expanded metal lathing, rendered with cement and roughcast; others with various forms of steel sheeting. One type has horizontal corrugations, which give a similar appearance to weather boarding. Others have vertical corrugations with splayed angles to the corrugations instead of round angles. These give clear vertical lines and a pleasing appearance. Whichever type of steel sheeting is used it is suitably lined with an insulating material and an internal surface such as plasterboard, which construction gives a good thermal resistance.

In the case of any frame construction, either concrete or steel, it is necessary to watch that the frame and cladding, both inside and out, are somewhat comparable with the cost of a brick cavity wall.

In conclusion, I should like to refer again to the subject of cost, for whether houses are built by individuals or by the nation, it is necessary the cost should be such as can be afforded. Our nation is planning for the building of 4,000,000 houses. If we can save £200 on the cost of each house, the nation would be saved the cost of the much-sought-after American loan. This loan will lower our standard of living and will compel us to export many articles we should like to retain for our own use. In view of the fact that we are now a poor nation and must work to produce everything we wish to enjoy, we should decide upon a reasonable standard for a house. Comfort, durability, appearance and surroundings are essentials that must receive due consideration, but we must also consider cost, and whether housing is provided by private enterprise or by municipalities, or whether it is built by traditional construction or other methods, we must keenly watch each item of cost and prevent a burden of debt that would lower our standard of living.

A SHACKLED INDUSTRY

MR. GALBRAITH ON CONTROLS

A PLEA for greater freedom for the builder was made by MR. J. S. GALBRAITH, President of the London Master Builders' Association, at the annual general meeting of the Association's Central No. 5 Area in Putney on Tuesday. Major G. P. Parker, the retiring Chairman, presided.

Builders had hoped, said Mr. Galbraith, that with the advent of peace many wartime restrictions would have been raised, and the industry would have been permitted, in a lesser or greater degree, to get back its freedom.

"Instead," he proceeded, "what do we find? A vast builders' merchant organisation is being set up under the Ministry of Works, whose duty it will be to provide materials for housing and other such projects; it is to have a capital running into millions and will take away from us any chance of buying where we wish and receiving when we want.

"The Ministry of Health has loaded the dice in favour of one type of dwelling-house, carried out under one system, which is almost entirely under the control of the local authorities, who also decide whether you are to have a licence or not. They borrow the money for housing at very advantageous terms—to let the houses at uneconomic rents. The builder is invited to compete with them—if he can—and obtain his materials where he can. Again, the whole of the control of War Damage repairs has been placed in the hands of the local authorities, as has been the resurrection of 'flat' houses. We are pretty well tied up, and despite that fact, and also the fact that we as an industry have had nothing to do with the tieing, we are constantly being blamed for all the defects of the building industry."

Having detailed many of the war-time handicaps from which the industry suffered and is still suffering, Mr. Galbraith said "We are well and truly shackled. Neither the L.M.B.A. nor the National Federation can offer you any protection against the law of the land, but it can, with your support, make known the builders' point of view to the powers that be, and it can also, with your assistance, make that point of view known to the general public."

MR. G. W. BUCHANAN, President of the National Federation, replied for the visitors.

Home Information Centre.

The Home Information Centre exhibition, organised by the Women's Gas Council in co-operation with the Housing Centre, is being held at 169, Regent-street, W.1, by courtesy of Messrs. Ewart and Son, Ltd.

CORRESPONDENCE

[Whilst we are glad to publish letters on professional and other matters of interest to our readers, it must be understood that we do not necessarily endorse the remarks of ocorrespondents, who will oblige us if they will express their views as briefly as possible.]

Building Costs.

TO THE EDITOR OF *The Builder*

SIR,—In your issue of November 23 a correspondent, writing under the nom de plume of "Chartered Architect," cast a reflection on all builders alike when he inferred that building firms were cashing in on the abnormal conditions prevailing in the building world—that in other words they were deliberately aiming at excessive profits.

Whilst there are, no doubt, black sheep in all trades and professions, from my own experience as a senior member of the staff of a reputable firm of building contractors may I strongly protest that "Chartered Architect's" remarks are both ill-timed and misleading.

If anything, there is a tendency to cut prices to a dangerously low margin of profit. Contractors need and want the work and (for a moment ignoring the ethical standpoint) they obviously are not going to waste time and expense tendering in competition (very often in open competition) at absurdly high prices.

Cowley. CHAS. S. COX.

Flats for Single Women.

TO THE EDITOR OF *The Builder*.

SIR,—With reference to the article in *The Builder* of November 23, on the Hostel for single women at Warriston-street, Carntyne, as a single woman I should like to congratulate the Glasgow Corporation on providing this type of accommodation. This type of housing is much-needed all over the country, and especially in London, where flats (of a convenient size with all facilities) for single women have always, even before the war, been at a premium.

If the local authorities of all large towns and cities would give this type of housing a "high priority" they would have the grateful thanks of a very much overlooked section of the electorate—myself included.

London, S.E.1. E. A. KIRCH.

OBITUARY

Mowbray A. Green, R.W.A., F.R.I.B.A.

The death has taken place in Bath of Mr. Mowbray Aston Green, at the age of 80. Mr. Green was an authority on 18th-century architecture and had published books on the "18th Century Architecture of Bath." Articled to Alfred Goodridge, A.R.I.B.A., he studied at the A.A. and University College, London, travelling widely on the Continent. Mr. Green set up in practice in 1890, designing new buildings in Bath, besides a great deal of restoration work, including the Assembly Rooms, completed in 1938. Illustrations of the restorations were given in *The Builder* for June 24 of that year.

W. H. Benfield.

We regret to record the death on December 6 of Mr. W. H. Benfield, a director of Messrs. Benfield and Loxley (Oxford), Ltd.

A Military Award.

We learn that Captain Leslie Farmiloe has been awarded the M.C. for distinction in action in the Battle of Knightsbridge in Libya, in May, 1942, in which he was wounded and taken prisoner. Captain Farmiloe, who has now been invalided out of the Army, is a director of Messrs. T. and W. Farmiloe, Ltd., of Westminster.

WAGES AND PRODUCTION

NATIONAL JOINT COUNCIL AGREEMENT

The following statement of heads of agreement on wages and production was issued by the National Joint Council for the Building Industry on Tuesday.

1. The National Joint Council for the Building Industry have decided upon a general wage-increase of 4d. per hour for craftsmen with the corresponding 80 per cent. rates for labourers, to take effect as from the beginning of the pay-week following January 1, 1946. The effects of these increases for a full week of 44 hours will be as follows :—

Grade.	CRAFTS. Per hour. Present.	Per hour. New.	Per week (44 hrs.). Present.	Per week (44 hrs.). New.	LABOURERS (80 per cent.). Per hour. Present.	Per hour. New.	Per week (44 hrs.). Present.	Per week (44 hrs.). New.
			£ s. d.	£ s. d.			£ s. d.	£ s. d.
Inner London	2/3½	2/7½	5 0 10	5 15 6	1/10	2/1¼	4 0 8	4 12 7
Outer London	2/3	2/7	4 19 0	5 13 8	1/9½	2/1	3 19 9	4 11 8
A	2/2	2/6	4 15 4	5 10 0	1/9	2/-	3 17 0	4 8 0
A1	2/1½	2/5½	4 13 6	5 8 2	1/8½	1/11¾	3 15 2	4 7 1
A2	2/1	2/5	4 11 8	5 6 4	1/8	1/11¼	3 13 4	4 5 3
A3	2/0½	2/4½	4 9 10	5 4 6	1/7¾	1/11	3 12 5	4 4 4
B	2/-	2/4	4 8 0	5 2 8	1/7¼	1/10½	3 10 7	4 2 6

2. In arriving at this decision the main points taken into account by the employer bodies and trades unions have been as follows :—

(i) that output must be increased quickly at least to the 1938 level;

(ii) that if the great task of rebuilding Britain, including the erection of several million new homes, is to be efficiently carried out, we must start with a contented industry, sufficiently attractive to get and keep the large number of recruits required;

(iii) that systematic overtime work must be abolished in such a way that the operatives have not only the leisure which is necessary if they are to work efficiently, but wages adequate to enable them to enjoy that leisure;

(iv) that sound planning and firm estimates are only possible if there is a reasonable expectation that wages and materials costs do not fluctuate unduly.

3. Throughout the negotiations both sides have been fully aware of the criticisms, in recent months, of employers as well as operatives on the ground of low output. They recognise that these criticisms are partly, but only partly, justified. The causes are known. Indeed, the increases in wages now agreed must, if they are to be maintained, be followed within a short time by a decrease, and not an increase, in the cost of building. Otherwise the building in traditional materials of homes for the people is bound to be delayed.

4. There are many reasons why, in the last year or two, the level of output has fallen below the pre-war level :—

(a) the calling-up of supervisory staffs and of many of the best workers, leaving elderly and inexperienced workers often in unbalanced gangs;

(b) the working of excessive overtime.

(c) the prevalence of unofficial interruption of work such as "tea breaks";

(d) the demoralising effects of the direction of men to remote districts;

(e) the retention under the Essential Work Order of men who did not want to stay with employers who did not want to keep them, and the consequent undermining of discipline;

(f) the use of "cost plus" types of contract, particularly on war-damage repairs;

(g) the uninteresting nature of much of the war-time work; and the general reaction following the tension of the war years.

5. The removal of these adverse factors; the return of experienced workers from the Forces; the establishment of balanced gangs; and the resumption of the normal working week, are bound, in the ordinary course, to result in increased output. This is not enough. Output must be increased more quickly. The leaders of both sides, with the fullest sense of their responsibility, have, therefore, pledged themselves to secure at the earliest possible date an output at the 1938 level. They have, therefore, agreed to take the following joint action, in which it is hoped the Press will help, to bring home to their respective members the need for an immediate increase in output by the operatives and in efficiency of management by the employers :—

(i) To set up a special National Joint Production Committee, with Regional Committees, whose sole function will be to secure a higher rate of production. These Committees will also take steps to remove bottlenecks and any other causes of delays reported to, or discovered by, them. The National Committee will also consider whether it is practicable to devise such a workable system of payment by results as would lead to further reduction in building costs. Where necessary, joint committees will pay special visits to difficult sites or backward areas.

(ii) Also to set up jointly a Committee of Review which will consist of an equal number of representatives of employers and operatives together with co-opted independent persons—e.g., economists, accountants, qualified to advise. This Committee will have power to call for information from the respective Federations and will be responsible for reviewing progress at regular intervals and indicating whether output has increased and whether that increase is reasonable. Reports of this Committee will be published.

(iii) To take action, jointly where necessary :—

(a) To secure the early removal of such regimentations as Directions, Essential Work Order, etc., and of their bad effects and to terminate or modify corresponding war-time arrangements within the industry itself.

(b) To ensure that men are got back to their home towns and to their own employers and to expedite the return to the building industry of men from other industries as well as from the Forces.

(c) To abolish systematic overtime.

(d) To prevent the unnecessary movement of workers.

(e) Recognising the evils of uncontrolled "cost plus," to facilitate the return to a system of tendering at the earliest practicable moment

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PROBLEMS OF THE MAINTENANCE BUILDER

NEW L.M.B.A. COMMITTEE.

A MAINTENANCE Builders' Committee, under the chairmanship of Mr. Phillip Smallwood, who next year will be its Senior Vice-President, has been set up by the London Master Builders' Association, in answer to a demand from some of its members that their particular problems, differing as they do from those of the contract builders, the house-builders and the many other types of builders who meet round the Council table of the L.M.B.A., require special consideration.

Each of the eleven areas has nominated a representative, and the Committee will be strengthened by the presence of two members of the Administrative Committee, Mr. A. J. Chapman, J.P., and Mr. J. A. Birch, with, when contract matters are under discussion, Mr. W. H. Gough-Cooper, the Chairman of the Contracts Committee of the Association.

The first meeting of the Committee will be held on December 17, and thereafter it will meet once a month.

Members are still free, if they so desire, said Mr. G. H. A. Hughes, Director of the L.M.B.A., to represent points of difficulty on maintenance matters direct to the Association, which is, of course, the executive body for the London Area, but the establishment of the new Committee should save much of the Administrative Committee's time by studying the problems in advance and making the recommendations to the Administrative Committee. The Maintenance Builders' Committee will not itself have any executive powers. All recommendations and resolutions from it will go to the Administrative Committee.

"THE SIGNIFICANCE OF MEASUREMENT IN BUILDING WORK"

A PAPER on this subject was read before the South Western Branch of the Chartered Surveyors' Institution on November 27 by Mr. Alan W. Davson, F.S.I., chartered quantity surveyor.

The audience present to-night (said the speaker) includes all sections of surveyors. Measurement may or may not appear to loom large on their horizon, but it will be seldom that at some time they will not gain an advantage by its proper use either in their professional capacity as a surveyor or in their private capacity as householders or tenants.

The purpose of measurement is to arrive at a tender price or price for the work, but its significance depends on how it is used. Let me try to explain. A complete building consists of many component parts; for instance a casement window includes the frame, the sash, the glass, and the ironmongery. It is easy to imagine, therefore, what an infinite number of component parts (covered by some 20 trades and subtrades) there would be in a building or scheme designed for a wide variety of uses.

The primary control of building operations rests with the architect. It is his instructions which determine the component parts to be used. Measurement (which, of course, includes description) must truly interpret the instructions given, whether it is derived from drawings (as it will be for a new conception) or from existing buildings for alteration work.

The significance of measurement is only fully achieved when, in addition to the architect's instructions, the builder receives a bill of quantities which :—(1) Describes the particular conditions governing the work and the risks he is called upon to take; (2) Analyses the component parts in terms of the total quantity of labour and material required in agreed units of measurement and description.

These particulars enable the contractor to determine the price he will apply to the units of construction necessary and to arrive at his tender.

The Standard Method.

Some twenty years ago it was realised that many surveyors had their own ideas as to the units of measurement which should be used. Quantity surveyors and builders, therefore, got together and drew up the Standard Method of Measurement for Building Work. This document has been periodically revised and is now again under revision. Previous to revision an announcement is made in the Press, so that everyone interested can make suggestions for its improvement. It is very important to remember that this document is intended to cover all classes of building work and that it must, therefore, be comprehensive. To some people the terms "comprehensive" and "over elaborate" seem synonymous, and further reference will be made to this later.

As stated in "The Chartered Quantity Surveyor and His Work," when a bill of quantities is prepared on the basis of the Standard Method and upon drawings or instructions which accurately forecast the work as it is to be executed and has been priced by the contractor, it serves the following purposes :—(1) Offers a common basis for competition between contractors; (2) Gives to the building owner a close indication of his commitment; (3) Sets a target for all concerned in the building operation and by the joint efforts of the contracting parties gains an early control over price; (4) Reduces to a minimum the work involved in arriving at interim payments on account of the work; (5) Reduces by forethought any necessary variations and thereby assists in the organisation of the work and the economic use of manhours; (6) Provides a basis for the valuation of any work varied or additional work ordered within the terms of the contract.

It is doubtful if amongst this audience there will be any dispute as to the value of such a document as a basis for comprehensive work. It is accepted as the ideal method by the R.I.B.A. The National Federation of Building Trades Employers have issued instructions calling for quantities for work over £1,500. The Central Council for Works and Buildings, in their recent report on "The Placing and Management of Contracts," confirms the bill of quantities as the ideal method, and emphasises the value of the independent quantity surveyor.

But the necessity for this method for smaller work may be questioned. It may be suggested that to give the builder instructions on the basis of drawings and specifications is quite sufficient, and to leave measurement in his practical hands is a less elaborate procedure and results in lower tendering with equally good results.

"Builder's Estimate."

Such a suggestion calls for comparison between a bill of quantities and a builder's estimate. The former is a document presented to the builder and containing measurements for him to price. It must, therefore, be prepared fully in line with the agreed Standard, with the contractor's risks fully set out, and the necessary component parts fully analysed, otherwise the builder can make claims on the ground that the case has not been properly represented to him. This is only fair.

A builder's estimate is a document prepared for his own purposes and need not be understood by anyone but himself. It can contain the details of a bill of quantities and sometimes does, when it will be the technical equivalent. But the builder, or his estimator, has less access to the architect than a quantity surveyor, and usually is pressed for time in the preparation of his estimate. For these reasons his measurements of the component parts, together with the description of their character and quality, will usually be very much abbreviated and will be the particular builder's interpretation of the instructions given. In addition, the risks not being set out for him, he must cover them in the prices attached to his abbreviated measurements. The builder's estimate, when accepted, forms the basis for the settlement of the account—not a document prepared by an independent person.

Undoubtedly this method has been, and can be, successful. When limited to individual jobs or schemes or to work of a simple character, and where this procedure satisfies everyone, there would seem to be no object in changing. Whether or not it is cheaper cannot be proved, because there is no adequate basis for comparison between the two methods.

But where the scheme is one concerning : (1) Similar small buildings spread throughout the country, or (2) Small dwelling houses where there is considerable repetition, it is submitted that the case for a bill of quantities is very strong.

Quantities for Small Units.

In reference to (1) I always believed in the use of bills of quantities for small work in a simplified form and advocated a system before a general meeting of quantity surveyors in 1936. The late Mr. Widdowson, then chief quantity surveyor of the Office of Works, decided to let my firm try an experiment with this system, and at the discussion at the general meeting used the following words :—

"For a great number of years I have felt that tendering without quantities was unscientific and led to difficulties. The Office of Works had issued a large number of invitations to tender for work under £1,500 without quantities, and the quantity surveyors sometimes were called upon to clear up a good deal of confusion afterwards. I therefore welcomed an experiment of this type."

For this work type plans were identical but details varied, and the buildings were clothed in a different manner to suit the locality. The cost of the buildings varied from £1,000 to £3,000 pre-war prices. The drawings were well prepared. The experiment was successful and the practice was continued until the war started. During this period bills for a large number of small jobs were prepared for work all over the country by my firm alone. It is reasonable to deduce from this fact that the application of the principle of the bill of quantities achieved the purposes for which the experiment was made.

Of certain advantages we have confirming evidence, namely : (1) That there were very few adjustments necessary in the measurement and that such adjustments, being on an agreed basis, were simple to arrive at; (2) That the time of the unsuccessful competitors was saved; (3) That the necessity for a separate specification being avoided, duplication of wording was saved together with a considerable amount of typing and paper.

Only one substantial objection was raised to this procedure, and this was by my colleagues. Unfortunately, in the early stages I termed the bill an "Abridged Bill of Quantities," and they feared, quite properly, that such an abridgement might prove the thin edge of the wedge and that all their labours in building up a Standard Method of Measurement might be undermined if this became general. In fact, it was possible to satisfy them that the principles of the Standard Method were closely adhered to.

Over-elaboration.

Before dealing with the use of the principle of the bill of quantities for small

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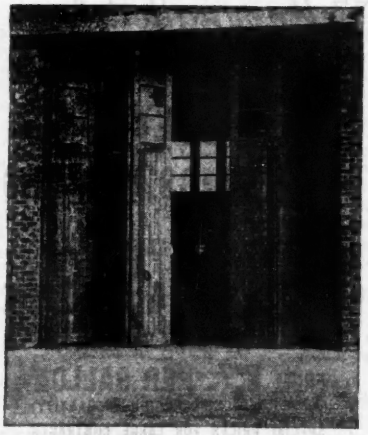

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dwellings, it may be permissible to refer here to the question of over-elaboration, for charges of over-elaboration in relation to bills of quantities and the Standard Method are usually made in respect of the number of items included in bills of quantities for small dwelling houses. This is not a very good basis for the allegation for two reasons—first, because bills of quantities have not been used to any extent for this purpose owing to the veto of the Ministry of Health, and secondly, because such comparisons have been made between the number of items contained in a bill of quantities and in a builder's estimate—documents prepared from two different standpoints.

In relation to general building work, if over-elaboration occurs, it will probably arise from one of two causes—either where the surveyor is over-academic in his interpretation of the Standard Method, or where the proper translation of the architect's instructions results in a superfluity of items which are unnecessary to economic design.

In connection with the Standard Method, any general charge of over-elaboration is unlikely to be true, as those controlling this method are practical men on both sides and they will not be at pains to give extra work to one another in their respective callings.

The number of items in a bill need not govern the cost, for pricing will be regulated to an agreed method of measurement by those who understand it. But in the case of housing, a large number of house builders confine themselves to this class of work and think of the constitution of the component parts and their analysis in terms of measurement from this angle only. They do not understand methods used for the general purposes of building.

The Code of Measurement.

The Code of Measurement for Small Dwelling Houses of traditional type has been devised to overcome this difficulty. The idea was the result of a personal letter, in May, 1943, from the President of the L.M.B.A. to the Chairman of the Quantity Surveyors' Committee. The President stated that builders wanted quantities for housing work, but that the Ministry of Health would not listen to their use if based on the Standard Method.

Perhaps the most interesting stage in the development of the Code was after the N.F.B.T.E. and the C.S.I. (through their Quantity Surveyors' Committee) had agreed to devise some method for housing. A Joint Committee of builders with considerable experience in housing and quantity surveyors was formed. This Committee started with an entirely open mind and many avenues of approach were explored. One point of view was that the more remote the result from the Standard Method of Measurement the less confusion could there be. Another suggestion was that materials and labour should in some form be given separately; another that the foundation of measurement should be on the method of pricing generally adopted for this work. It was found, however, that there was no general method. It gradually became evident that an abridgment of the Standard Method was the most suitable procedure, which was a tribute to those who prepared the Standard Method.

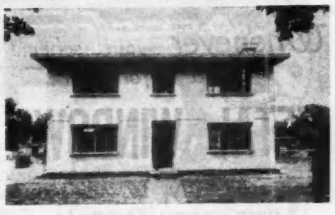
The principles having been settled, a small Sub-Committee delved into the details, and its members deserve the highest tribute for the voluntary work they undertook. By their efforts the Code was completed, and was submitted to and received the approval of the two bodies concerned. The Ministry of Health was approached, and as a result in September, 1945, issued a statement to local authorities advising them to make the fullest trial of the new system.

The success of the Code depends very made upon the way it is used. If some who use it think they know better than those who framed it, and reduce the number of items in the bill of quantities below the level of the Code, they will not give proper facilities to price the component parts, and whilst measurement will remain its significance will be lost.

Bills of Quantities or Alternative Methods.

This paper has centred around the bill of quantities prepared from full particulars from the architects for three classes of work. Even this ideal may not be sufficient for the future. It appears possible that the representation of the bill may have to be adjusted to assist more towards the organisation of the work, and to permit of comparison between the cost of work on comprehensive schemes throughout the country. In implementing this suggestion there will be many difficulties, but the trend of thought in this direction is very general, and is seen in such articles as that in *The Builder* of November 16 entitled, "Increasing Building Output," and subsequent correspondence.

Be that as it may, it is hoped it will be evident to the meeting that if the cost of comprehensive work is to be forecast, compared, and controlled in the best interests of the contracting parties: (1) That this cannot be done other than in terms of units of measurement prepared on a common basis; (2) That close collaboration in the early stages between architect and quantity surveyor is the only sure way of determining and setting out in the clearest terms the component parts and other information necessary to the contractor; (3) That the alteration of the constitution of any of the component parts or their components after the work has started not only involves adjustment of measurement but may also result in revised instructions which interfere with the organisation of the work and lead to a sense of frustration amongst all concerned.



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To those versed in measurement, the bill of quantities is not the dead document it may appear to the layman. It expresses in a language which they all understand, and of which the Standard Method or the Code are the vocabularies, all those human activities which are necessary to the completion of a building. Quantity surveyors know that measurement only has its full significance when the activities portrayed have not to be varied to any substantial degree.

It may well be asked, however, why has the bill of quantities, used under ideal conditions, been the subject of this paper, and why has no reference been made to alternative methods when the ideal has so seldom been fully achieved and so much has been done by approximate bills, schedules of prices, or the cost-plus method?

There are two answers to these questions—the first is that the paper is on the "Significance of Measurement," and not "Alternative Methods of Contracting," and that under no alternative method—with human nature as it is—can measurement have so great a significance.

The more remote alternative methods are from the ideal bill of quantities the more they are likely to reflect altered instructions or lack of instructions with the waste of time and effort which may result, and the less can control of cost be fully exercised at an early stage through the price applied to the measured units.

It may, however, be well that alternative methods should remain in general use whilst the present conditions of uncertainty remain. But this should only be for a brief period, and brings us to the second answer.

In the past there were many reasons why the ideal could not become general policy. The chief reason was that labour and material were available, and if anyone wanted to rush into building without adequate forethought he could do so. This will not be possible for at least the next two years, because the labour and material available will have to be restricted to high priority work.

There is, therefore, no reason for rushing and every reason for preparing full particulars ready for the time when labour and material are available. If in addition, as seems likely, the Government will be ready to advise architects in their particular regions as to the likely priority of the work with which their clients desire to proceed, there will be every encouragement to prepare the fullest particulars in terms both of drawings and measurement before placing a contract.

Now, therefore, is the time when a policy giving full significance to measurement can gradually be brought into general use. If the opportunity is lost it is unlikely to return and the full value of measurement as a stabilising influence will be lost to the building owner and all sections of the industry.

Services in Buildings.

The Codes of Practice Committee has issued for comment the draft Chapter VII Services (CP(B)502), of the Code of Functional Requirements of Buildings. The document is in nine parts, containing recommendations for Water Supply, Cooking Installations, Refrigeration, Laundering, Telecommunications, Sanitation and Drainage, Sewage Disposal and Refuse Storage and Disposal. Comments on this chapter will be welcomed by the Committee and carefully considered before the redraft is prepared. Copies may be obtained from the British Standards Institution, 28, Victoria-street, London, S.W.1.

INCREASING BUILDING OUTPUT

CAN A BONUS ON OUTPUT BE INTRODUCED?

We now give a final selection of correspondents' views on this subject. In a forthcoming issue the author of the scheme will reply to points made.—EDITOR.

From Mr. W. G. Layfield.

TO THE EDITOR OF *The Builder*.

SIR,—In last week's issue of *The Builder* Mr. Fawcett presented a gruesome picture of the building worker lying helpless on the operating table whilst being experimented on by the wicked employers. Supposing the analogy is accepted, is not the object of the operation to obtain a fair and, if possible, an increased production?—an object which Mr. Fawcett admits is "necessary, urgent, vital."

It should be remembered, too, that the patient himself can render the operation unnecessary by giving a fair output for wages received. Increased production by all is vital to the well-being of the nation, and one might say that the nation, in the form of the patient's family, depend on the success of the operation. Surely the object in mind is not so base as Mr. Fawcett would have one believe.

But there is another side to the picture—that of the employer, whether private or State, being the victim of a grossly one-sided agreement whereby the employer has to pay the operative a certain sum of money as wages but has no guarantee as to what he is going to get in return. When a builder enters into a contract he knows how much money (which may be likened to wages) is going to be paid to him, and on the other hand the client knows the type and size of building (which may be likened to production) he is going to get in return. Again, one goes into a shop, pays 2s. 4d., and knows that he is going to get (or is entitled to) 20 cigarettes. But there is no such foreknowledge of your returns in the building industry. An employer pays an operative 2s. per hour, but there is no guarantee as to what he is going to get in return; he may get two shillings' worth of production, and he may get only one shilling's worth. Can such an arrangement be defended by any reasonable person?

In the past we had the most undesirable incentive of unemployment. This, fortunately, has disappeared, but something must be put in its place, and I consider that a system of payment by results is desirable on equitable grounds. Knowledge of human nature shows that an inducement is necessary if extra output is to be obtained, and the bonus system suggested by your correspondent offers such an inducement. The production of a satisfactory system will not be easy, but there are no problems in this connection which cannot be solved by the co-operation of all parties to the question.

The problem of production is not a partisan one, it concerns everyone who has the well-being of the country at heart, and for this reason the operatives and employers should get together as quickly as possible in order to work out a solution that is fair and equitable to all.

I agree with Mr. Fawcett that a higher level of understanding by all is necessary in this connection, and would therefore suggest that the operatives should come forward with their ideas so that this understanding may be achieved and the present unsatisfactory state of affairs terminated.

W. G. LAYFIELD.

Birchington, Kent.

From Mr. E. G. Fish.

TO THE EDITOR OF *The Builder*.

SIR,—There are three aspects upon which I would like to make comment. Firstly, the apparent complexity of the scheme; secondly, the delay in paying the bonus; and thirdly, the fact that the bonus would appear to be payable to workmen who in fact have not earned it.

As to complexity, any bonus scheme should be such that the operatives can readily understand it, and be able to check the calculation of their share. It has been my experience that at least part of the unpopularity of P.A.Y.E. income tax deductions has been in the fact that the calculations are too complicated for the average building workman to understand, and without the co-operation and good will of the operatives, any bonus scheme is bound to fail.

In regard to the inevitable delay in the payment of the bonus, it seems to me that if the scheme is to have the maximum effect it must provide for periodical payments of bonus, preferably weekly. If calculations are delayed to the end of the contract and beyond, the beneficial effect on the output of a workman, whose vision goes very little farther than his weekly wage envelope, will be negligible. Indeed, the scheme will be in danger of creating ill-feeling on account of the delay. Also, it will not be an easy matter to distribute bonus to workmen who have left the contract many months previously.

As to the third point—that is, payment of bonus to men who had not earned it—no firm can afford to do this continually and survive. Presumably the saving in cost will not be calculated separately on each operation. If not, then it will be possible—indeed probable—for operatives to be entitled to bonus on the total saving in man-hours, whereas on the particular work on which they had been engaged they had been losing against schedule. This defect in the scheme is, in my opinion, serious enough to jeopardise it.

I do not wish it thought that I am criticising without being willing to put forward an alternative. To get over the drawbacks enumerated above, I would suggest very briefly, as follows:—

(1) Divide all the workmen up into gangs of convenient size; (2) treat each gang as a separate unit for bonusing purposes; (3) measure weekly the work done by each gang, and price at rates in accordance with the original tender; (4) compare the weekly wages paid to each gang with the measured value of the work done; (5) divide the saving as 50 per cent. to the builder and 50 per cent. to the workman in each gang which has made a profit over estimate.

This is a very brief outline of a scheme which was in successful operation for a number of years before the war. There is no need for the worker to complain, as it is in his own interest in any case to provide bonuses, and he will benefit by way of increased wages over standard rates.

E. G. FISH.

Spalding, Lincs.

From Mr. H. J. Horn.

TO THE EDITOR OF *The Builder*.

SIR,—The ingenious scheme submitted by your anonymous correspondent to increase output in the building industry largely overcomes the many objections to "payment by results." For this reason it is to be welcomed. It is in reality a co-partnership scheme for each individual job, in which the three parties involved will benefit, not only collectively but individually. Under the scheme, as I understand it, there can be no all-out effort on the part of one section where bonus is easily earned and a slackening off where no bonus is payable; no niggling over items showing a slight variation to schedule, and haggling over when and where a particular section is bonusable. No race on one section or trade which is bonused with no regard to the other sections or trades.

To get the best results a real interest must be taken in the whole job from beginning to end, and all concerned must work together as a team with common interest, profits being shared by all who help to earn them.

The scheme seems to provide for this, and I for one would be prepared to give it a trial. But how is it to be put into operation? Will the National Federation consider it and, after consultation with the operatives, authorise a test on certain specified work? Or is it suggested that individuals might do something on their own? And if a firm wished to try out the scheme, is there anything in our official rules and regulations which prevents it?

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From Mr. T. H. James.

... TO THE EDITOR OF *The Builder*.

SIR,—I consider your article of November 16 on "Increasing Building Output" of a high importance such as to justify reprinting, not only for further study and thought by those who have read it, but also for the benefit of readers who may have missed it.

I would stress two extracts from the letters received in reply:

Mr. D. C. Burgess.—"To get nothing in return for a £5 wage packet means heading for disaster; to get real work for a £10 wage packet may be the salvation of us all."

Mr. F. J. Gayer.—"One feels that the essence of a scheme must be simplicity, equity and applicability to all kinds and sizes of jobs and to all kinds of builders."

It would be of interest to readers to have some information on the system in

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operation in the U.S.A. and to what extent such a scheme can be applied to the industry in this country; also, if possible, to know how this matter is handled in the industry in the U.S.S.R., where we have been told output is high.

T. H. JAMES.

Kimber and James.
W.1.

From Mr. L. E. Wheble.

TO THE EDITOR OF *The Builder*.

SIR,—With reference to Mr. F. J. Gayer's letter in *The Builder* for Nov. 30, would it not be possible for all builders to arrange to pay into one pool a certain percentage of their gross profit on any work, and the pool discharge it (free of any income tax) to all workmen through their associations? The amount so received to be equally divided between all members every month, as an additional incentive for better and more efficient work.

L. E. WHEBLE.

Forest Hill, S.E.

IN PARLIAMENT

Specialist Personnel.

In reply to MR. BOSSOM, MR. BEVAN said that every effort was being made to accelerate the return to their jobs of the technical officers being released under Class B arrangements. The latest figure of technical officers actually released was 691.

Bills of Quantities.

MR. GOOCH asked the Minister of Health if he was aware that no member of the Builders' Federation would tender for houses to be erected by Cromer, Norfolk, urban council because they were not supplied with bills of quantities, with the result that no tenders were received by this council; and if he would instruct councils to supply bills of quantities.

MR. BEVAN said that a circular was sent to local authorities on August 9 recommending them to provide bills of quantities.

Shortage of Wallpaper.

MR. P. FREEMAN asked the Minister of Supply and of Aircraft Production whether he was aware of the shortage of wallpaper and the high prices demanded; and what steps were being taken to improve the situation in view of the demand for repairs and the new housing drive.

MR. W. LEONARD, who replied, said that the manufacture of wallpaper was suspended during the war owing to the shortage of raw material. Supplies of paper to the industry were, however, resumed last July and the current allocation allowed for production at about one-third of the pre-war level. As paper became more plentiful it was hoped that this allocation would be substantially increased. The prices of wallpaper were at present controlled under the Prices of Goods Act, 1939, but he was informed by the President of the Board of Trade that he was considering the issue of a Maximum Prices Order under the Goods and Services (Price Control) Act, 1941.

SIR W. SMITHERS asked the Minister of Works why prefabricated bungalows were put into store before being sent to site for erection; and what was the cost of storage.

MR. TOMLINSON: Temporary houses are not put into store, but as the 2,000 to 3,000 parts of each house are made in a large number of factories they are sent to distribution centres for assembly into complete house-sets before being issued to sites. These centres are still being set up and meantime costs cannot be accurately determined.

Brick Production.

MR. MORT asked the Minister of Works what steps were being taken to find the necessary labour of the right type in order to obtain full resumption of brick production at both closed and active brickworks; how many brickworks, to which 280 licences had been granted to reopen, had commenced operating; and whether he was satisfied that the current production of the brick industry and the speed of reopening was sufficient for the anticipated programme of house building next year.

MR. TOMLINSON: Special arrangements have been made to encourage and facilitate the return to the industry of experienced workers at present employed elsewhere and to secure that the scheme of release from the Forces operates as rapidly and effectively as possible; in addition, steps have been taken to ensure that the local Employment Exchanges have the labour requirements of each brickmaker under constant review; prisoners of war are also being used. Of the 280 works licensed to reopen, 36 were actually in production at the end of October. I cannot say that I am satisfied with the present rate of progress, but I hope that the efforts that are being made will result in the recruitment of the labour necessary to achieve the output required.

MAJOR LEGGE-BOURKE asked the Minister of Works how many standard size brick-built houses could be constructed from the present stocks of bricks available in this country; how long these stocks would last on the basis of present building activity; and what was the present annual output of the brick-making industry.

MR. TOMLINSON: The answer to the first part of the question can only be given as a very rough estimate and might be put at 50,000. In October sales exceeded production by 50,000,000, and on this basis stocks would be exhausted in about 20 months. Present production is at the rate of approximately 1,450 million a year.

Requisitioned Hotels.

SIR FRANK SANDERSON asked the Minister of Works whether he was aware that there were over 2,600 hotels and boarding houses in occupation by Government Departments, being used as offices by Civil Servants, which was the equivalent of not fewer than 250,000 bedrooms; and owing to the shortage of this form of accommodation, would he do his utmost to expedite the derequisitioning.

MR. TOMLINSON: No, Sir. The number of hotels and boarding houses in occupation by Government Departments for use as offices by Civil Servants is 169, containing about 10,000 bedrooms. Every effort is being made to expedite the release of these premises, but release is necessarily dependent on the availability of alternative offices.

Housing Costs.

MR. BOSSOM asked the Minister of Health whether local authorities were limited to the £1,300/£1,200 total cost for the typical Dudley Report Government house, or did this only apply to private builders.

MR. BEVAN said that these costs applied specifically to private builders. He proposed to publish, in due course, figures relating to prices approved in contracts let by local authorities.

TRAINING OF APPRENTICES

M.O.H. REMINDERS.

REFERRING to Circulars 159/44 of November 7, 65/45 of April 6, and 145/45 of July 30, relating to this scheme, the Ministry of Health reminds local authorities that, as stated in paragraph 7 of the Memorandum which accompanied Circular 159/44, the contract between the apprentice master and a local authority for building work carried out under the scheme will be a prime cost contract in the terms set out in Form MOW/AT/4, a copy of which accompanied Circular 145/45.

It is therefore unnecessary to invite tenders in respect of any building work to be carried out under the scheme or, if such work forms part of a house-building project for which tenders have been invited, to delay putting the work under the scheme in operation until tenders for the other work have been received and approved—provided that the necessary authorisation is obtained from the Ministry of Works for work to proceed pending agreement between that Ministry and the local authority on normal cost. In this event, any tenders to the local authority for similar work received and approved later may then be placed before the Ministry of Works for consideration when the amount of normal cost is being negotiated.

To expedite final approval, local authorities who have arranged with Joint Apprenticeship Committees to apply the scheme should send the plans of the proposed works forthwith to the Senior Regional Officer of this Ministry (or the Ministry of Education in the case of schools) so as to be ready as soon as possible after the Joint Apprenticeship Committee has received the preliminary approval of the Ministry of Works to send approved plans to that Ministry.

Local authorities desiring any further information or to visit localities where the scheme is already being applied are invited to communicate with the Secretary of the Building Apprenticeship and Training Council, at Lambeth Bridge House, Albert Embankment, London, S.E.1. Such visits may offer convincing evidence of the merits of the scheme.

It should be noted that the address to which applications for controlled materials should be sent (paragraph 4, Circular 65/45) has now been amended to: The Directorate of Works, Ministry of Works, Controlled Materials Section, Dean Bradley House (Room 708), Horseferry-road, Westminster, London, S.W.1.

THE SCOTTISH BUILDER

NEW BUILDINGS

DUMBARTONSHIRE.—Plans in hand for extensions, etc., for Beallie's Biscuits, Ltd., factory, at Great Western-rd., Drumchapel, for which the architects are John Keppie & Henderson, 176, West Regent-st., Glasgow.

GLASGOW.—Corporation to erect dining department, etc., at Cairncraig-st., for which the architect is John MacNab, 129, Bath-st., Glasgow

FUTURE CONSTRUCTION

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

DECEMBER 19.

†**North-Eastern Housing Assoc., Ltd.**—76 houses on 2 sites. J. W. Tibbs, secretary, Metrovick House, Northumberland-rd., Newcastle-on-Tyne.

DECEMBER 21.

Abertillery U.D.C.—36 houses at Swffryd site. C. Dep. £2 2s.

DECEMBER 22.

Bebington T.C.—48 houses and 2 bungalows at Bromborough. B.E. and S. Dep. £2 2s.

†***Malden and Coombe T.C.**—(a) Rebuilding Nos. 1 and 8, Robin Hood-la., (b) erection of 10 houses at Thorne-rd., (c) erection of 6 houses at Potters-gr. B.E.

DECEMBER 27.

Marlow U.D.C.—26 houses at Seymour Park-rd. C. Kelvin Smith, M.Inst.M.& Cy.E., S. Dep. £2 2s.

DECEMBER 28.

***Acton T.C.**—Rebuilding 8 houses. B.E.

***Acton T.C.**—Applications invited for rebuilding houses, construction of new houses and/or adaptation and repair of existing dwellings. Forms from B.E.

Bacup T.C.—16 houses at Thorn estate. H. Guffogg, M.I.M.& Cy.E., B.S. Dep. £3 3s.

Cardiganshire E.C.—Kitchen and dining-rooms at County Secondary School, Lampeter. R. Jones, County A, County Hall, Aberaeron.

†***Chislehurst and Sidcup U.D.C.**—66 houses on 2 sites. C. Dep. £2 2s. Tenders by January 12.

East Grinstead.—80 houses at Stone Quarry estate. Acting C. Dep. £2 2s.

Fleetwood T.C.—54 houses at Homestead estate. B.E. and S. Dep. £3 3s.

Hertford T.C.—30 houses, Horns Mill No. 3 site at Brickendon-la. E. C. Harris and Partners, FF.S.I., 3, Bedford-sq., London, W.C.1. Dep. £2 2s.

Liskeard R.D.C.—10 Swedish houses on various sites. E. C. Higman, 2, The Parade.

Llandilo R.D.C.—Contract No. 1—16 houses, Blaenau-rd., Contract No. 2—construction of roadway, etc., Blaenau-rd., Contract No. 3—12 houses, Cefngrug, Saron, Llanpebie, Contract No. 4—roadway, etc., Cefngrug, Saron. R. P. Walters, S. Dep. £2 2s.

***Northallerton U.D.C.**—1 block of 6 houses, 2 blocks of 4 houses at Crosby-rd. estate. S. F. Esland, C. Dep. £1 1s.

Plympton St. Mary R.D.C.—14 houses at Tamerton Foliot. Architect, Council Offices. Dep. £2 2s.

DECEMBER 29.

***Bridgwater T.C.**—78 houses at Hamp housing estate. B.E. Dep. £2 2s.

†***Essex C.C.**—5 pairs of police houses on 3 sites. H. Conolly (F.), County A.

Haverhill U.D.C.—20 houses and 8 bungalows at Helions Park. D. C. Denton-Smith, Architect, 40, Regent-st., Cambridge. Dep. £3 3s.

Heanor U.D.C.—18 houses, with site and road works, off Mill-la., Codnor. R. Archer, M.Inst.Mun.& Cy.E., E. and S. Dep. £3 3s.

†**Kidsgrove U.D.C.**—60 houses at Mow Cop site. Wood, Goldstraw and Yorath, chartered architects, Station-rd., Tunstall, Stoke-on-Trent. Dep. £5 5s. Tenders by January 10.

Luton R.D.C.—4 pairs of houses off Luton-rd., Toddington. E. and S. Dep. £2 2s.

Sutherland C.C.—Work in various trades for 60 houses at Golspie and Brova. E. W. Brannen (L.), County A., Dornoch.

Witney R.D.C.—6 houses at Brize Norton. C., 14, The Hill, Witney. Dep. £2 2s.

DECEMBER 31.

Brynmawr U.D.C.—34 houses with site and road works at Twyncynghordy estate. S. Short, C. Dep. £3 3s.

***Cowes U.D.C.**—44 houses at Upper Mill Hill site. E. and S. Dep. £2 2s.

East Barnet U.D.C.—118 houses and 12 flats. C. M. Barnes, E. and S. Dep. £2 2s.

Gloucester R.D.C.—24 houses on 4 sites. Applications in writing to C. D. Carus-Wilson, Hardwicke, Glos. Dep. £3 3s.

BUILDERS' CHRISTMAS HOLIDAYS

BUILDING work in London will stop only on Christmas Day and Boxing Day. This is the effect of a resolution of the London Regional Joint Committee, representing both operatives and employers.

The resolution is as follows: The London National Joint Committee record that in accordance with the London Working Rule Agreement for Building Trade Operatives, jobs in the London District will be closed for the Christmas holiday on Tuesday and Wednesday, December 25 and 26, which are the only days of holiday defined in the Rule.

It is emphasised that shops and jobs should be open on Saturday, December 22 and Monday, December 24.

***Maidenhead B.C.**—36 houses (3 contracts) at Pinkneys-rd. estate. B.E. Dep. £2 2s.

Melksham U.D.C.—36 houses. D. H. McKerchar, A.M.Inst.C.E., E. and S. Dep. £2 2s.

South Molton R.D.C.—6 houses on 2 sites. A. G. Oxland, architect, 8, East-st., South Molton. Dep. £2 2s.

***Street U.D.C.**—22 houses at 2 sites. N. H. H. Darby (A.), Westminster Bank-chbrs., Taunton. Dep. £2 2s.

***Weston-Super-Mare T.C.** — Reinstating damage at Winter Gardens Pavilion. B.E. and S.

†***Winchester T.C.**—150 houses. H. S. Sawyer and A. E. T. Mort, High-st., Winchester. Dep. £2 2s.

JANUARY 1.

Fareham U.D.C.—70 houses on 3 sites. E. and S. Dep. £2 2s.

Lewes T.C.—40 houses at Site 1a, Landport estate. C. T. Butler (L.), B.S. Dep. £2 2s.

Tendring R.D.C.—4 pairs of Swedish houses. S. E. Carroll (L.), E. and S. Dep. £1 1s.

***Solihull U.D.C.**—44 houses at Redlands-rd. scheme and Alston-rd. scheme. C. R. Hutchenson, B.Sc., A.M.Inst.C.E., E. and S., 90, Station-rd. Dep. £5.

***Welton R.D.C.**—14 pairs of houses on 8 sites. F. L. Leach, S. Dep. £1 1s.

***Yeovil T.C.**—56 houses, Milford housing scheme. A. J. Price, A.M.Inst.C.E., B.S.

JANUARY 2.

***Beaconsfield U.D.C.**—20 cottages on 2 sites. J. H. Crosby, S. Dep. £2 2s.

***Tunbridge Wells T.C.**—114 houses, Powdermill-la. estate. B.S. and Water E. Dep. £5 5s.

JANUARY 3.

Kidsgrove U.D.C.—36 houses at Banbury-st., Butt-la. Wood, Goldstraw and Yorath, Chartered Architects, Station-rd., Tunstall. Dep. £5 5s.

JANUARY 4.

***Conisborough U.D.C.**—30 houses at Cadeby-av. and Gardens-la. E. and S. Dep. £2 2s.

Newry U.D.C.—56 houses with road works off Armagh-rd. Town S. Dep. £5 5s.

JANUARY 7.

***Leeds T.C.**—Adaptation of Red Hall, Shadwell, into hostel. Superintendent of Works and Buildings, 125, Beckett-st., Leeds, 9. Dep. £2 2s.

Oakengates U.D.C.—60 houses at 3 sites. M. S. Lee, Council Offices. Dep. £2 2s.

***Southall B.C.**—2 houses at Lady Margaret-rd. and 1 at North-rd. B.E. and S. Dep. £2 2s.

JANUARY 8.

***Whiston R.D.C.**—18 Swedish timber houses and bungalows at Smithy-la. Watson Garbutt, S. and Architect. Dep. £2 2s.

JANUARY 9.

Connah's Quay U.D.C.—60 houses, Clough's housing estate. H. Jones, M.Inst.M.& Cy.E., S. Dep. £2 2s.

JANUARY 10.

***Birkenhead T.C.**—59 houses on 2 sites. B Robinson, B.E. and S. Dep. £2 2s.

JANUARY 14.

Ellesmere Port U.D.C.—Re-erection of 4 houses at Grange Farm estate. E. and S. Dep. £1 1s.

Littlehampton U.D.C.—72 houses and 6 bungalows at Hill-rd. site. J. A. Young, M.Inst.M & Cy.E. E. and S. Dep. £2 2s.

JANUARY 15.

***Tamworth T.C.**—48 houses at Fazeley-rd. site. B.E. and S. Dep. £2 2s.

NO DATE.

***Aldeburgh T.C.**—5 pairs houses at Leiston-rd. Dep. £2 2s. (Bills of Quantities ready first week in January.)

Marshland R.D.C.—34 Swedish timber houses in various districts. E. A. Brown, Council Offices. Dep. £2 2s.

MISCELLANEOUS

DECEMBER 28.

Birkenhead C.B.—Demolition of shelters. B.E. and S. Dep. £1.

Northwich R.D.C.—Demolition of 52 shelters. E. and S.

JANUARY 4.

Wood Green T.C.—Dismantling of Anderson shelters. B.E. and S. Dep. £1 1s.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

JANUARY 5.

Bexley T.C.—B.E. and S.

West Riding C.C.—County S.

JANUARY 9.

East Suffolk C.C.—County S.

JANUARY 12.

Dorset C.C.—County S.

ROADS, SEWERAGE AND WATER WORKS

DECEMBER 28.

Nantwich R.D.C.—Roads and sewers at 3 sites. E. and S. Dep. £2 2s.

DECEMBER 29.

†**Kidsgrove U.D.C.**—Roads and sewers, Mow Cop site. Wood Goldstraw and Yorath, Station-rd., Tunstall, Stoke-on-Trent. Dep. £2 2s.

Wycombe R.D.C.—Laying of 640 lin. yds. of 9-in. sewer, etc., at Naphill. W. A. E. Tanner, E.

DECEMBER 31.

Frimley and Camberley U.D.C.—Roads and sewers. E. and S. Dep. £2 2s.

***Halifax C.B.**—Roads and sewers, Cousin-la. housing site. B.E. Dep. £2 2s.

***Leighton Buzzard U.D.C.**—Roads and sewers at Garden Hedge. H. A. Rolls, Chartered Architect, 16, Bridge-st. Dep. £2 2s.

***Nantyglo and Blaina U.D.C.**—Roads and sewers. H. Budger and Co. (F.), 95-97, St. Mary-st., Cardiff. Dep. £3 3s.

Wirral U.D.C.—Roads and sewers, Oaklea (Irby) site. S. Dep. £1 1s.

JANUARY 1.

Lewes T.C.—Accommodation road at Winterbourne-la. estate. B.S. Dep. £1 1s.

JANUARY 3.

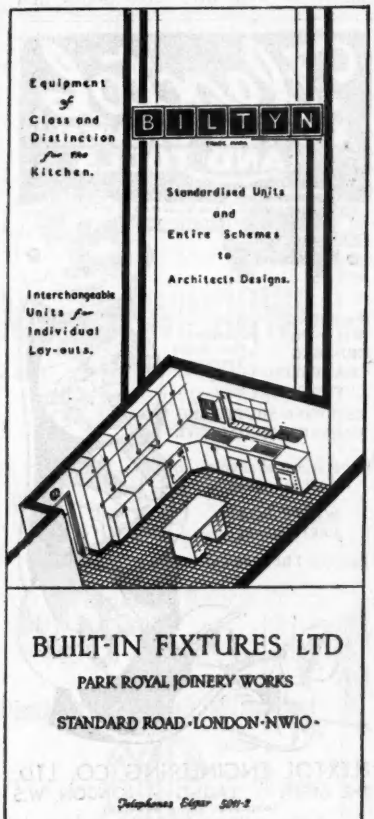
Luton T.C.—Roads and sewers at Flitwick. B.E. Dep. £2 2s.

JANUARY 10.

Kingsbridge R.D.C.—Laying mains and incidental works (three contracts). Lemon and Blizard, 24, Lockyer-st., Plymouth. Dep £3 3s.

JANUARY 14.

***Linslade U.D.C.**—Roads and sewers. H. A. Rolls, chartered architect, 15, Bridge-st., Leighton Buzzard. Dep. £2 2s.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***Southborough U.D.C.**—Roads and sewers, Manor-rd. site. C. Dep. £2 2s.

***Southborough U.D.C.**—Roads and sewers, North Farm-rd. and Stewart-rd., High Brooms. S. Dep. £2 2s.

***Southborough U.D.C.** — Laying approx. 1,340 yds. of 3-in. and 4-in. spun iron water pipes, etc., Manor-rd. site. C.

Widnes T.C.—Construction of Cronton Booster station. T.C. Dep. £2.

JANUARY 18.

Stratford-on-Avon R.D.C.—Construction of 13,800 lin. yds. of 5-in., 4-in. and 3-in. dia. water mains, etc., in 3 districts. Willcox, Raikes and Marshall, 33, Gt. Charles-st., Birmingham, 3. Dep. £5 5s.

NO DATE.

Pocklington R.D.C.—Supply and laying of approx. 1,900 lin. yds. of 6-in., 4-in. and 3-in. dia. spun-iron mains, etc., in 2 parishes. J. H. Haiste, M.Inst.C.E., 4, Queen-sq., Woodhouse-la., Leeds, 2.

PUBLIC APPOINTMENTS

*Full details of Public Appointments marked * are advertised elsewhere in this issue. Those marked † have been advertised in previous issues.*

DECEMBER 18.

***Essex E.C.**—Lecturer in Architectural Building Construction and Specification Writing at South-West Essex Technical College and School of Art, E.17.

DECEMBER 22.

***Blyth R.D.C.**—Technical Assistant.

DECEMBER 24.

†Leamington Spa.—Clerk of Works.

DECEMBER 28.

†Birkenhead C.B.—(a) Senior Architectural Assistant; (b) 2 Architectural Assistants.

***Slough T.C.**—Clerk of Works.

***Slough T.C.**—Chief Building Inspector.

***Whitby U.D.C.**—Clerks of Works.

DECEMBER 29.

***Hawarden R.D.C.**—Clerk of Works.

DECEMBER 31.

***Beds C.C.**—(1) 2 Architectural Assistants; (2) Quantity Surveyor, Grade I; (3) Quantity Surveyor, Grade II; (4) Building Surveyor.

***Bilston T.C.**—(a) Quantity Surveyor; (b) Clerk of Works.

†Harris Institute, Preston.—Assistant Lecturer in Building Dep.

***Luton T.C.**—(1) Chief Planning Assistant; (2) 2 Planning Assistants; (3) Estates and Maintenance Assistant; (4) 2 Junior Engineering Assistants; (5) Building Inspector.

†Melksham U.D.C.—36 houses. D. H. McKerchar, A.M.Inst.C.E., E., S. and Architect. Dep. £2 2s.

†Nottingham T.C.—Architectural Assistant.

†Nottingham T.C.—Housing Architect.

JANUARY 1.

***Aireborough U.D.C.**—Clerk of Works.

***Huddersfield T.C.**—Assistant Architect, Grade IV.

***Sevenoaks R.D.C.**—Clerk of Works.

JANUARY 5.

***Kingston-upon-Thames T.C.** — Temporary Architectural Assistant.

JANUARY 7.

***Barrow-in-Furness C.B.**—(a) Senior Architectural Assistant; (b) Architectural Assistants, Grade E (2); (c) Architectural Assistants, Grade D (2); (d) Junior Building Inspector; (e) General Engineering Assistant.

***Morley T.C.**—Housing Director.

***Robert Gordon's Colleges, Aberdeen.**—Lecturer and Studio Instructor in Constructional Subjects.

***St. Helens T.C.**—Building Manager.

JANUARY 11.

***East Ham C.B.**—Temporary Town Planning Assistant.

JANUARY 12.

***Dartford T.C.** — Senior Architectural Assistant.

***North Riding E.C.**—Architectural Assistant.

JANUARY 14.

***Southport C.B.**—Assistant Clerk of Works.

JANUARY 15.

†Bucks C.C.—County Architect.

***Leeds T.C.**—Planning Assistant.

†Somerset C.C.—County Planning Officer.

JANUARY 21.

***Fulham B.C.**—Temporary Architectural Assistants.

FEBRUARY 11.

†University of Liverpool T.C.—Full-time of Ungraded Lecturer and Studio Instructor at School of Architecture.

NO DATE.

Barnsley C.B.—Builders' Manager.

***Northern Polytechnic.** — Part-time Lecturer (Evenings) in Dept. of Architecture.

***Rhodesia Railways, Ltd.**—Architect.

GENERAL BUILDING WORK

Bury.—E.C. propose nursery school at Fishpool.

Caernarvonshire.—C.C. propose erection of police houses on selected sites, at £20,000.

Coventry.—T.C. propose development of housing site at Monks Park.

Halesowen.—Branch of British Legion propose British Legion Hall, at £10,000.

Holmes Chapel.—Cheshire E.C. propose school at Middlewich-rd.

Leigh.—T.C. propose 196 additional houses at Thompson-st. (No. 2) site.

Liverpool.—E.C. propose kitchen and dining-room at Speke County school.

Manchester.—T.C. approved: Cooked meats factory at Leestone-rd., Northenden, for Manchester & Salford Equitable Co-operative Society, Ltd., Downing-st.; 110 houses at Walmsley-rd., Moston, for J. Saxon, 508, Victoria-av., Blackley, Roberts, Wood & Elder, architects, 26, King-st.; factory at Waterloo-rd., Hightown, for S. Glister, Broughton, Atkinson & Eagle (L.), architects, 37, Brown-st.

Mansfield.—Trustees of Mansfield & District Orthopædic Guild propose Orthopædic Clinic.

Newcastle, Staffs.—T.C. approved covered market at Hassell-st., at £3,000, for Markets Committee. — C.E. Authorities propose "modern" school at Ashfields.

Oldham.—Miss Elizabeth Danby, 11, Princess-st., Hanover-sq., London, W.1, is architect for 2,000 houses on three sites at Moorside, for Thomas Mellodew & Co., Ltd.

Ormskirk.—U.D.C. to develop land at Tower Hill and Manor-rd., Burscough, for houses.

Rotherham.—T.C. propose housing site on 655 acres of land off Wortley-rd.—T.C. approved: Factory, Psalters-la., for R. Goldthorpe, 46, Meadow-st.

Sheffield.—University Court of Governors propose extensions and additional hostels for students.—T.C. propose housing sites at Norton, Greenhill and Bradway.

Staveley.—U.D.C. propose 436 houses at Ingersoll.

Wallasey.—E.C. propose dining-room at Oldershaw Grammar school.

TENDERS

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government departments*.

Abercarn.—30 houses on two sites, for U.D.C. E. G. Jenkins, Architect, S. & E., Council Offices: William Rowles, 183a, King's-rd., Cardiff.

Brierfield.—28 houses at Mansfield estate, for U.D.C. Major W. D. Haigh, F.I.A.S., M. Inst. M. & Cy.E., E. & S.: *Russell Bros, Nelson.

Canterbury.—24 houses at Reed-av., for T.C. L. Hugh Wilson (A.), City A.: *H. W. Collingwood & Sons, Barham, Kent, £25,806.

Castleford.—Rebuilding 17 and 19, Churchfields-la., for U.D.C. R. A. Easdale & Sons, architects, County-chbrs., Brady-st.: *J. L. Rodger & Sons, Ltd., Eastfield-la., Castleford, £2,197.

Chichester.—Eight houses for R.D.C. J. K. Lawson, E. & S.: *Chichester R.D.C. Works Department (two, Fishbourne), £1,848; *E. S. C. Arnell, Selsey (two at Norton, Selsey), £2,088; *R. L. Coates, Ltd., East Wittering (four, East Wittering), £4,341.

Coventry.—Building Trades Training Centre for M.O.L.: *W. J. Whittall & Sons, Ltd., Lancaster-st., Birmingham 4.

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Darlington.—12 houses at Glebe-rd., Harrowgate Hill, for T.C.: *F. Hills & Son, Stockton, £12,720.

Darlington.—15 houses at Hurworth, for R.D.C.: *Parvin & Sons, Darlington, £17,150.

Deben.—Four houses at Ufford, for R.D.C. D. Jenkinson, S., A. W. J. Mullins, Architect: *F. Boston, 9, Carlton-rd., Kesgrave, nr. Ipswich, £4,568.

Doncaster.—152 houses, Lambeth Walk, Warmsworth-st., Wheatley Park, etc., for T.C. R. E. Ford, Estates S., 3, Priory-pl.: *Frank Haslam, Ltd., Hall Cross, Doncaster, £150,139.

Gateshead.—12 houses in flats: *J. Clark & Sons, New Seaham, Co. Durham.

Gt. Yarmouth.—70 houses at North Dene estate, for T.C.: *Comben & Wakeling, Ltd., £79,045.

Hackney.—Rebuilding flats at Hindle House, Arcola-st., for T.C. W. G. Goodwin (L.), Housing Manager; *H. J. Walker & Sons, 15, Morden Court-parade, Morden, Surrey, £13,300 (subject to M.H. approval).

Hitchin.—16 houses at Codicote and eight houses at Shephall, for R.D.C. B. S. Ewing, F.S.I., E. & S.: *C. E. Bowyer, Codicote-rd., Welwyn, Herts.

¶London (Air Ministry).—List of contracts to value of £500 or over for the week ended December 8, 1945:—

General maintenance work: Robison and Davidson, Dumfries; Walter Lawrence & Son, Ltd., London, E.C.2; A. M. Griffiths & Sons, Ltd., Wolverhampton; Taylor Woodrow Construction Co., Ltd., Southall, Middx; T. H. Kingerlee & Sons, Ltd., Oxford; H. Dorrington & Son, Gainsborough; Wm. Cowlin & Sons, Ltd., Bristol 2; Wm. Wright & Son (Lincoln), Ltd., Lincoln. *Painting work:* West Midlands Erection Co., Ltd., Wolverhampton.

¶London (M.o.W.).—Contracts placed by M.o.W. during week ended November 29:—*London:* Camberwell B.C.9, Seco houses, Snelling & Rayment, 282, Mitcham-la., London, S.W.16; Woolwich, Arcon houses, Lavender McMillan, 54, Cheam Common-rd., Worcester Park. *Angus:* Dundee, railway approach track, Sir Robert McAlpine & Sons (Scotland), Ltd., Clydebank, Glasgow. *Ches.:* Wallasey, kitchen, at Wallasey High school, Boultons (Bebington), Ltd., School-la., Bebington. *Cornwall:* Falmouth, preparation of housing sites at Penwerris estate, E. Thomas, Falmouth. *Denbighshire:* Glascoed, additions and alterations to R.O.F., W. & A. Davies, Ltd., Snatchwood-rd., Abersychan. *Devonshire:* Tiverton B.C. Area, preparation of housing sites, Staverton (Builders), Ltd., Totnes, Devon; Teignmouth, preparation of housing sites at Kingsdown estate, Staverton (Builders), Ltd., Totnes, Devon. *Dumfriesshire:* Dumfries, central kitchen at Thornhill school, Campbell Bros., Deanston-dr., Glasgow. *Durham:* Felling U.D.C.1, Tarran houses, George Henderson, Boldon-la., East Bolton. *Essex:* Walthamstow, Seco houses, E. S. Moss, Ltd., 159, Brent-st., London, N.W.4; Dagenham, central kitchen at Marley-rd., C. J. Manning (Builders), Ltd., 432, Catherine-rd., Forest Gate, London, E.7. *Hampshire:* Southampton, Arcon houses, E. H. Burgess, Ltd., Augustine-rd., Northam, Southampton; Gosport, Arcon houses, Warings (Contractors), Ltd., Hillsea, Portsmouth; Farnborough, re-roofing machine shop at R.A.E., Snelling & Rayment, 282, Mitcham-la., Streatham, London, S.W.16; Portsmouth, C.B.7, Seco houses, Warings (Contractors), Ltd., Hillsea, Portsmouth; Portsmouth, C.B.6, Arcon houses, Warings (Contractors), Ltd., Hilsea, Portsmouth.

Herts: Bushey U.D.C.1, Arcon houses, Leightons (Contractors), Ltd., 10, Chandos-st., London, W.1. *Kent:* Rochester, Arcon houses, Bristowes Jarvia, Ltd., 18, Queensbury-pl., London, S.W.7; Sheerness U.D.C.1, Seco houses, G. E. Wallis & Sons, Ltd., Broadmead Works, Maidstone; Ashford U.D.C.1, Seco houses, G. E. Wallis & Sons, Ltd., Broadmead Works, Maidstone. *Leics:* Melton-Belvoir, Spooner houses, A. H. Taylor (Nottingham), Ltd., 151, Attenborough-la., Attenborough. *Middx:* Wembley, Arcon houses, Comben & Wakeling, 603/605, Kenton-rd., Harrow. *Midlothian:* West Calder, Seco houses, G. & R. Cousin, 24, Hill-st., Edinburgh. *Monmouthshire:* Bedwellty, 1, Arcon houses, A. N. Coles (Contractors), Ltd., Marshfield-road, Castleton, Cardiff. *Oxfordshire:* Oxford City Council 2, aluminium houses, Benfield & Loxby, Ltd., 106, Bullingdon-rd., Oxford. *Renfrewshire:* Renfrew, adaptations at M.o.W. Temporary Housing and Distribution Centre, Lockheed Aircraft Corporation, James Laidlow & Sons, Ltd., 12, Playfair-st., Glasgow. *Shropshire:* Wenlock, Tarran houses, W. Higley & Son, 8, Pride Hill-chmbs., Shrewsbury; Oswestry R.D.1, Tarran houses, M. A. Boswell, School-st., Wolverhampton. *Surrey:* Epsom and Ewell, Seco houses, Limpus & Son, Ltd., 7, Kingston-hill, Kingston-on-Thames. *Warwickshire:* Birmingham, adaptations and alterations at King Edward's High school, F. Deeley, Ltd., 208, High-st., Harborne, Birmingham; Birmingham, adaptations and alterations at King Edward's High school, J. E. Harper & Son, Ltd., 72-82, Lombard-st., Birmingham. *Wilts:* Bradford-on-Avon, Seco houses, W. E. Chivers Sons, Ltd., Devizes, Wilts. *Worcs:* Halesowen, Tarran houses, J. & W. Malley, Ltd., 2-8, Wills-street,

Birmingham. *Yorks:* Beverley, Tarran houses, R. Cleminshaw, Ltd., 103, West-pde., Hull; Sheffield, Tarran houses, Vernon Dunk, Ltd., Summer-la., Barnsley.

¶London (War Dept).—Works contracts placed by War Dept. for week ended December 1:—

Yorks: Miscellaneous work, J. Roxby Surtees, Black Hill, Co. Durham.

Manchester.—Works for T.C. L. C. Howitt (F.), Acting City A. Rebuilding upper part of Elm-st. Cold Stores, for Markets Committee: *Alfred Hodkinson, Ltd., 62, Greenhill-st., Hulme 15, Manchester; 12 houses, Benchill, for Housing Committee, J. Hughes (F.), Housing Director: *F. Gannon & Son, 64, Osborne-rd., Levenshulme 19, Manchester; 16 houses on various small sites: *J. Gerrard & Son, Ltd., Pendlebury-rd., Swinton, Manchester; 30 additional houses, Parkfield, Wythenshawe: *Direct Labour Section, Manchester Corporation.

Market Harborough.—30 houses at Bowden Fields. J. G. Barlow, M.Inst.M. & Cy.E., E. & S.: *Winton Hayes, Ltd., Biggleswade, £32,395.

Montgomeryshire. — Canteen kitchen and dining-room at Welshpool County school. H. Carr, Architect: *J. Dearn, Llanfyllin, £1,900.

Newcastle-on-Tyne.—(a) 73 houses at Longbenton estate, and (b) 60 houses at Blakelaw estate, for City Council. R. G. Roberts, City A.: (a) *Hadden & Hillman, New Bridge-st., Newcastle, £78,431; (b) *W. D. & R. Allison, Whiteburn, Co. Durham, £64,584.

Newcastle, Staffs.—110 additional houses, Beasley Farm estate, for T.C. A. Cotton, B.S.: *G. & J. Seddon, Ltd., 55, Duke-st., Fenton, Stoke-on-Trent, £126,123.

Rawtenstall.—Two houses at Schofield-rd., for T.C. J. H. Pollard, B.E.: *H. S. Hargreaves, 7, Elizabeth-st., Whitewell Bottom, Waterfoot, £2,312.

Rotherham. — 200 houses, Herringthorpe estate, for T.C. Vincent Turner, B.E.: *Stokes, Taylor & Shaw, Ltd., Sheffield, £196,500.

Sedgefield.—20 houses at Chilton: *R. M. Chamberlain, Belle Vue Bank, Gateshead.

Sheffield.—Works for T.C. W. George Davies (F.), City A. Reinstatement of portion of Abbeydale Grammar school: *W. Malthouse, Ltd., Derbyshire-la., Sheffield 8, £5,765; 16 houses in lieu of 30 houses, Parson Cross Extension site: *M. J. Gleeson, Ltd., 822, Chesterfield-rd., Woodseats 8, £14,468; 24 houses in lieu of 32 houses, Parson Cross Extension site: *W. Memmory & Sons, Swallownest, £29,500.

Tipton.—60 houses at Denbigh estate, for T.C. B.E. & S.: *Asphalt & Public Works, Ltd., Norwich Union-chbrs., Congreve-st., Birmingham 3, £67,320.

Tynemouth.—Erection of factory at trading estate, for Ronson's Products, Ltd.: *H. D. Hastil, Ltd., King-st., North Shields.

Wallsend.—189 houses at Station-rd. estate: *William Leech, 2, Clayton-st., Newcastle-on-Tyne.

Wetherby.—Erection of houses, for R.D.C. Architects: G. A. Burnett, 76, Albion-st., Leeds, for Wetherby site; Jones & Stocks, 7, Blenheim-ter., Leeds 2, for Bramham, Boston Spa, Clifford and Thorner sites Wetherby (10 houses): *Kettlewell & Charnock, Collingham, £11,178; Bramham, Boston Spa, Clifford, Thorner: *L. Matthews, North-st., Wetherby, £26,232.

Widnes.—Completion of 166 houses at Lower House-la., for T.C. James Holt, A.M.Inst.C.E., M.Inst.M. & Cy.E.: *Leyland Construction Co., Leyland, Lancs, £172,229.

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